

November 11, 2016

VIA E-MAIL AND U.S. MAIL

Ms. Nancy Heskett
Municipal Division
Minnesota Pollution Control Agency
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Rochester, MN 55904
Phone: 507-206-2605
Email: nancy.heskett@state.mn.us

**Re: Public Comments and Contested Case Petition for the Minnesota River
Valley Public Utilities Commission on Proposed NPDES/SDS Permit No.
MN0068195**

Dear Ms. Heskett:

On behalf of the Minnesota River Valley Public Utilities Commission (“MRVPUC”) please accept the enclosed comment letter and contested case petition filed pursuant to Minn. R. § 7000.1800 and 7000.1900, challenging the legal and factual basis for the proposed 5.4 kilograms per day (calendar month average June – September) total phosphorus effluent limit in MRVPUC’s draft National Pollutant Discharge Elimination System/State Disposal System permit No.: MN0068195, as follows:

1. Comment letter dated November 11, 2016 from Mr. Jeffery Kerkow, MRVPUC Chairman, on behalf of MRVPUC;
 - a. Appendix Item A, Letter from the Minnesota Environmental Science and Economic Review Board to MPCA Commissioner Stine regarding utilization of RES implementation procedures contrary to rule, September 13, 2016;
 - b. Appendix Item B, MPCA response to City of Mankato comments including recent data from the Minnesota River (undated);
 - c. Appendix Item C, Memorandum from Andrew Eaton, Joint Editorial Board of the Standard Methods for the Examination of Water and Wastewater, November 19, 2014;
 - d. Appendix Item D, Freedom of Information Act responses from the United States Environmental Protection Agency, from September 12, 2014 and December 5, 2014, respectively.

Ms. Nancy Heskett
Minnesota Pollution Control Agency
November 11, 2016
Page 2

2. Petition for a contested case hearing pursuant to Minn. R. §§ 7000.1800 and 7000.1900, which relies upon and incorporates by reference MRVPUC's November 11, 2016 comment letter and appendix;

Thank you for your attention to this important matter. Should you have any questions or require additional information, please do not hesitate to contact me at (651) 225-8840 or via email at dmmarx@flaherty-hood.com.

Very truly yours,

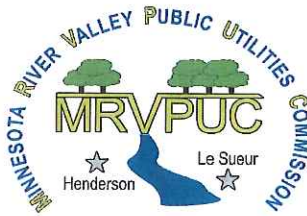
FLAHERTY & HOOD, P.A.

A handwritten signature in black ink, appearing to read "Dan Marx", written over a horizontal line.

Daniel Marx

Encl.

cc: Mayor Robert Broeder, City of Le Sueur
Mayor Paul Menne, City of Henderson
Mr. Jasper Kruggel, Public Service Director, City of Le Sueur
Ms. Wendy Turri, Minnesota Pollution Control Agency, Section Manager
Mr. Steven Weiss, Minnesota Pollution Control Agency, Effluent Limits Unit
Ms. Jean Coleman, Attorney, MPCA Legal Services Unit



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**RE: Public Comments of the Minnesota River Valley Public Utilities Commission
on Proposed NPDES/SDS Permit No. MN0068195**

Dear Ms. Heskett:

On behalf of the Minnesota River Valley Public Utilities Commission ("MRVPUC"), please accept the following comments regarding the Minnesota Pollution Control Agency's ("MPCA" or "Agency") proposed National Pollutant Discharge Elimination System/State Disposal System ("NPDES/SDS") Permit No.: MN0068195 for MRVPUC's wastewater treatment facility ("WWTF"). This comment letter articulates the factual and legal basis for the attached petition for a contested case hearing pursuant to Minn. R. § 7000.1800 and 7000.1900 challenging the proposed 5.4 kilograms per day (calendar month average June – September) total phosphorus effluent limit in MRVPUC's draft NPDES permit.

Introduction

MRVPUC is dedicated to clean water and to ensuring that its customers' and ratepayers' resources are used efficiently and effectively to protect Minnesota's waters. As a local government entity charged with protecting the health of both the communities it serves and the Minnesota River, MRVPUC is deeply concerned that the MPCA's approach to addressing phosphorus pollution throughout the Minnesota River Basin is scientifically flawed, unlawful, and ineffectively targets municipal point sources to address a problem clearly caused by non-point source pollution.

MRVPUC has been actively removing phosphorus from the Minnesota River since 2006, when it received its first permit limit for phosphorus. In 2011, during the subsequent permit cycle, the MPCA imposed additional and more restrictive phosphorus limitations on MRVPUC. Consequently, MRVPUC has already invested substantial financial resources and made significant reductions to its limited share of phosphorus pollution to the Minnesota River.

Now in 2016, for the third consecutive permit cycle, the MPCA again seeks to impose more restrictive phosphorus limitations on MRVPUC based on the MPCA's recently adopted River Eutrophication Standards. These additional phosphorus restrictions will impose added short and long-term treatment costs and have potentially significant impacts on the future economic and social development of the cities of Le Sueur and Henderson.

However, as a result of the scientific and legal flaws in the MPCA's River Eutrophication Standards and the Agency's approach to implementing those standards, the proposed more restrictive phosphorus limit—and the short and long-term costs necessary to achieve that limit—will fail to produce any measurable benefits to the Minnesota River. The below analysis suggests that this tragic result will be repeated if the MPCA's proposed approach is implemented throughout the Minnesota River Basin. Unfortunately, this would lead to the inefficient use of limited local and state clean water resources that could be allocated more efficiently and effectively to clean the Minnesota River.

MRVPUC recognizes that some additional regulations on and efforts from publicly owned WWTFs will be required to ensure clean water in Minnesota now and into the future. We are willing to continue to work in partnership with the state to improve water quality provided that regulations are based in sound science, effectively benefit water quality and are imposed legally and fairly. In this case, however, the MPCA misses the mark.

Background

MRVPUC treats the combined municipal wastewater from the cities of Le Sueur and Henderson as well as pretreated wastewater from Le Sueur Cheese Agropur.

The WWTF discharges directly to the Minnesota River (Class 2B, 3C, 4A, 4B, 5, 6 water) and is designed to treat an average wet weather (AWW) flow of 1.842 million gallons per day (mgd), an average dry weather flow of 1.255 mgd and a peak hourly wet weather flow of 3.4 mgd.

On October 14, 2016, the MPCA published MRVPUC's draft NPDES permit for notice and public comment. The draft permit, among other conditions, contains a new proposed phosphorus water quality based effluent limit ("WQBEL") of 5.4 kilograms per day (calendar month average June – September) (*see* Draft Permit at 32; Fact Sheet at 17-20).

This proposed permit limit is based on the application of Minnesota's River Eutrophication Standards (hereinafter, "RES") (Minn. R. 7050.0150, .0220, 0222 and Minn. R. 7053.0205). The permit limit at issue was derived from the application of the RES as identified in *Procedures for Implementing River Eutrophication Standards in NPDES Wastewater Permits in Minnesota* (version 1.0) November 2015 (hereinafter, "Implementation Rules") and *Phosphorus Effluent Limit Review: Minnesota River Basin* (version 4.4), Dennis Wasley (February 18, 2016) (hereinafter, "Effluent Limit Review").

OBJECTIONS TO PHOSPHORUS WQBEL IN PROPOSED PERMIT

MRVPUC objects to the proposed phosphorus WQBEL of 5.4 kilograms per day (calendar month average June – September) based on the following grounds:

1. MPCA's use of the Implementation Rules document in application of the RES constitutes illegal and/or unadopted rulemaking.

MPCA developed the wasteload allocation (“WLA”) and permit limits applicable to MRVPUC (and all other permittees in the Minnesota River Basin) based on the Implementation Rules document and the Effluent Limit Review. All of the “statement[s] of general applicability and future effect” contained in these documents constitute rules under Minnesota law.¹ Minn. Stat. § 14.02, subd. 4. The rules enunciated in these documents are both inconsistent with and substantively amend the RES as adopted by the MPCA and were not subject to formal notice and comment rulemaking under the Minnesota Administrative Procedures Act.² Therefore, MPCA's use of and reliance on the rules established in the Implementation Rules document as the basis for establishing WLAs and setting effluent limits to meet the RES violates state law.

2. The MPCA failed to implement the RES based on long-term summer average conditions.

The methods used by the MPCA to calculate WLAs and WQBELs in the Minnesota River Basin pursuant to the Implementation Rules and the Effluent Limit Review performed by MPCA are inconsistent with the RES requirement to use long-term summer average conditions.

a. The RES requires use of long-term summer average conditions—including average summer flows.

The RES were adopted to control total phosphorus and the resultant algal growth based on average conditions occurring over the summer season, June - September. *See* Minn. R. 7050.0150, Subp. 5. MPCA specifically adopted rule clarifications to ensure that compliance with the RES was not mandated under rare low flow conditions typically used to evaluate compliance for other chronic and acute criteria. Minn. R. 7053.0205, Subp. 7. C (stating “[d]ischarges of total phosphorus . . . must be controlled so that the eutrophication water quality standard is maintained for the long-term summer concentration of total phosphorus, when averaged over all flows”) (emphasis added); *see also* Minn. R. 7050.0150, Subp. 5, (stating that in evaluating compliance with the RES the Agency must use the “summer-average”

¹ These objections were previously raised by the Minnesota Environmental Science and Economic Review Board (“MESERB”), of which MRVPUC is a member. *See* Appendix Item A, Letter from MESERB to MPCA Commissioner Stine regarding utilization of RES implementation procedures contrary to rule, September 13, 2016.

² MRVPUC objects to all of the rules enunciated in the Implementation Rules document including but not limited to the following: (1) the response potential analysis employed by the MPCA; (2) the use of 80% exceeds flow as the “critical” river flow; (3) the use of 70% AWWDF as the flow condition applicable to WWTFs; (4) the use of one half of the RES criteria as the applicable background concentration of total phosphorus.

concentration” of the applicable impairment criterion) (emphasis added). In fact, MPCA recently defended a challenge to its implementation of the RES, clarifying that compliance with the criteria is based on long-term average conditions, not short term, or infrequent low flow conditions. *See Minnesota Ctr. for Envtl. Advocacy v. Minnesota Pollution Control Agency*, No. A15-1622, 2016 WL 3223177, at *1 (Minn. Ct. App. June 13, 2016).

Consequently, the RES unambiguously requires the Agency to use long-term summer average conditions—including long-term summer average flow conditions—to evaluate compliance with the adopted standards and calculate WLAs and QBELs that are protective of the RES.

In violation of this requirement, the Agency is employing a mass-balance approach to calculate the applicable WLA and QBEL for MRVPUC—and permittees throughout the state—using an 80% exceeds flow condition for the relevant river flow, combined with a 70% average wet weather design flow (“AWWDF”) condition for the applicable WWTFs. The use of these rare flow conditions is inconsistent with the RES as adopted and leads to the calculation of WLAs and QBELs that are far more restrictive than necessary.

- b. *Evaluation of 80% exceeds flow for the Minnesota River near Jordan demonstrates it is not consistent with the definition of average.*

An evaluation of the data in this case shows that that the river flow selected by the MPCA for calculating the WLA and deriving the QBEL applicable to MRVPUC are vastly different from the actual average summer flows in the Minnesota River. For example, the median and arithmetic average summer flows for the Minnesota River at Jordan (the monitoring station immediately downstream of MRVPUC’s discharge) are 6,598 cfs and 7,778 cfs, respectively. However, the flow conditions selected by the MPCA (80% exceeds summer flow) is 1,420 cfs (see Figure 1).

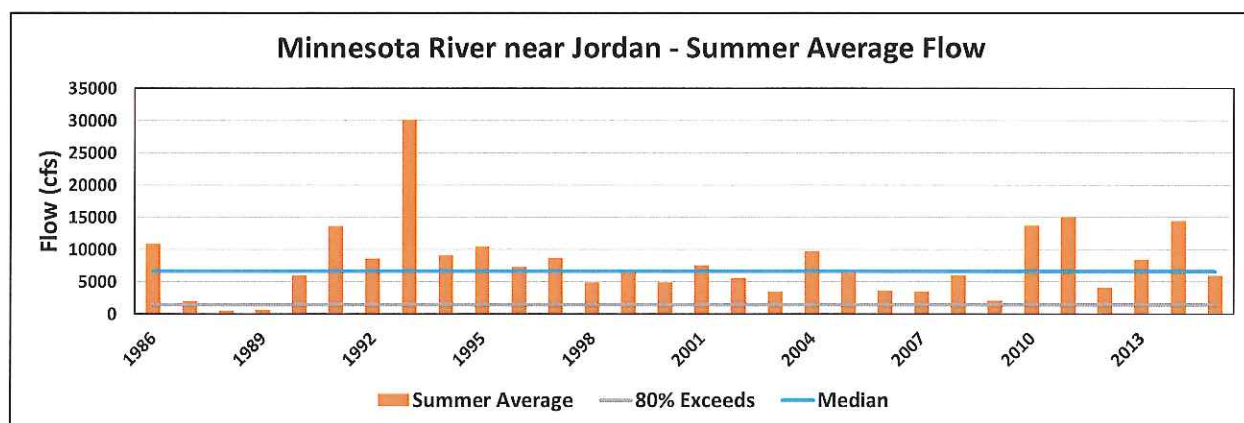


Figure 1

As demonstrated by Figure 2 below, the 80% exceeds summer flow (1,420 cfs) selected by the MPCA has a return frequency of 14 years. The United States Environmental Protection Agency (“USEPA”) recommends a once in three year exceedance frequency for protecting aquatic life. A

5-10 year exceedance frequency would be highly protective. Therefore, use of a flow condition with a return frequency of greater than 10 years is unnecessarily restrictive and inconsistent with the long-term summer average.

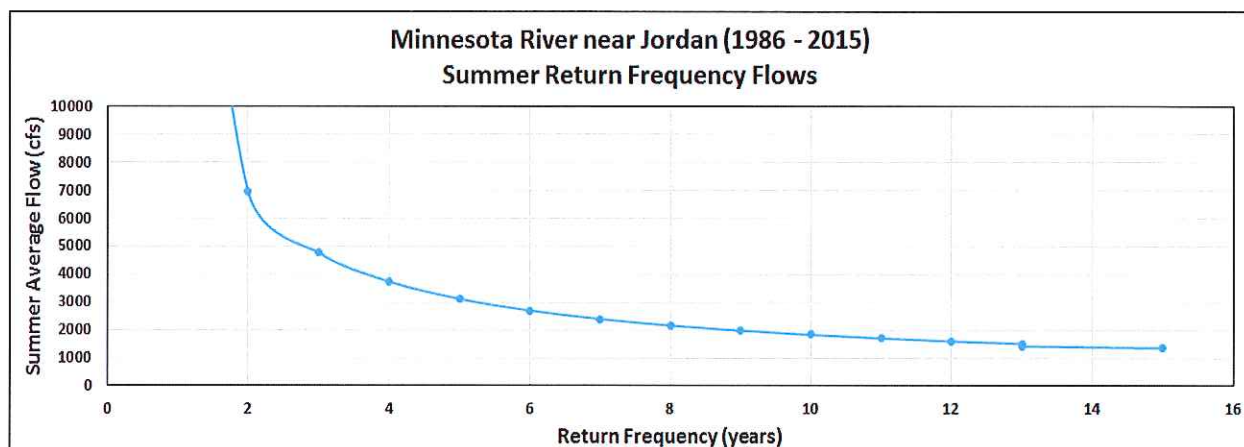


Figure 2

Because the RES is based on a long-term summer average concentration, it is inappropriate to use the 80% exceeds flow as the basis for calculating WLAs. The selected flow for the WLA assessment should be at least 6,600 cfs, not 1,420 cfs.

c. *Use of 70% AWWDF for WLAs and WQBELs is improper.*

The effluent flow used in the calculation of WLAs and WQBELs must be consistent with the selected receiving water flow, particularly if dry weather conditions are used as the basis for evaluating compliance with the RES. At a minimum, MRVPUC should be allowed to provide data showing the relationship between wet weather flow conditions and dry weather flow conditions to demonstrate whether an alternative flow should be used. If analyzed properly, it is likely that MRVPUC's average dry weather design flow would be more appropriate.

Furthermore, if the summer average WWTF flow is plotted against the corresponding summer average Minnesota River flow it is likely to show that that it would be extremely rare for the 70% AWWDF to occur simultaneously with the 80% exceeds flow in the river.

In summary, by employing equations that use or rely upon an extremely rare low flow condition for the river, paired with a rare high flow condition for the WWTF, the Agency is simulating an *exceptional* rather than *average* scenario that has led to the calculation of a WLA and WQBEL for MRVPUC that is far more restrictive than necessary. Consequently, the proposed permit calculation formulas and the derived WLA and WQBEL are fundamentally flawed, in excess of statutory authority and contrary to applicable NPDES rules that govern permit limit derivation. See 40 CFR 131.20, 131.21 (commonly known as the *Alaska Rule* which prevents a permit writer from creating either a more or less restrictive standard in issuing NPDES permits).

3. The Agency failed to incorporate recent reductions in phosphorus loading from point and non-point sources in making impairment determinations and deriving the WLA and WQBEL applicable to MRVPUC.

Minnesota rules, federal regulations, and the MPCA's own guidance require that the reasonable potential analysis, calculation of WLAs, and setting of effluent limits for total phosphorus must be based on current data that incorporates recent reductions to pollutant loading from point and non-point sources. *See* Minn. R. 7053.0205, Subp. 7. C; 40 C.F.R. § 122.44(d).

- a. *The impairment determinations, WLA and permit limit applicable to MRVPUC are not based on current data.*

The Effluent Limit Review presents water quality data purporting to show that various segments of the Minnesota River exceed the RES for total phosphorus ("TP"). For example, the memorandum presents the following figures illustrating the TP load in the Minnesota River at Jordan (Figure 3) and at St. Peter (Figure 4) relative to river flow.

Figure 2. Daily monitored summer (June-September) total phosphorus load of the Minnesota River at Jordan (station MI-39.4) from 2002-2011. Percent exceeds flow based on 1984-2013 summer flows (Minnesota River at Jordan). Concentration at critical flow = 0.132 mg/L (n=15). Blue line represents load at RES (0.150 mg/L).

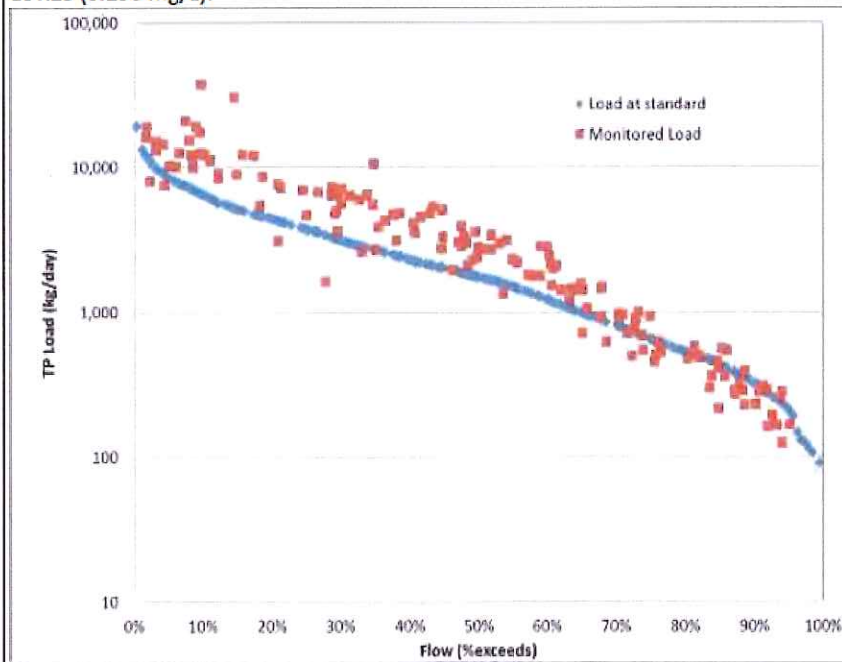


Figure 3 (Effluent Limit Review at 5)

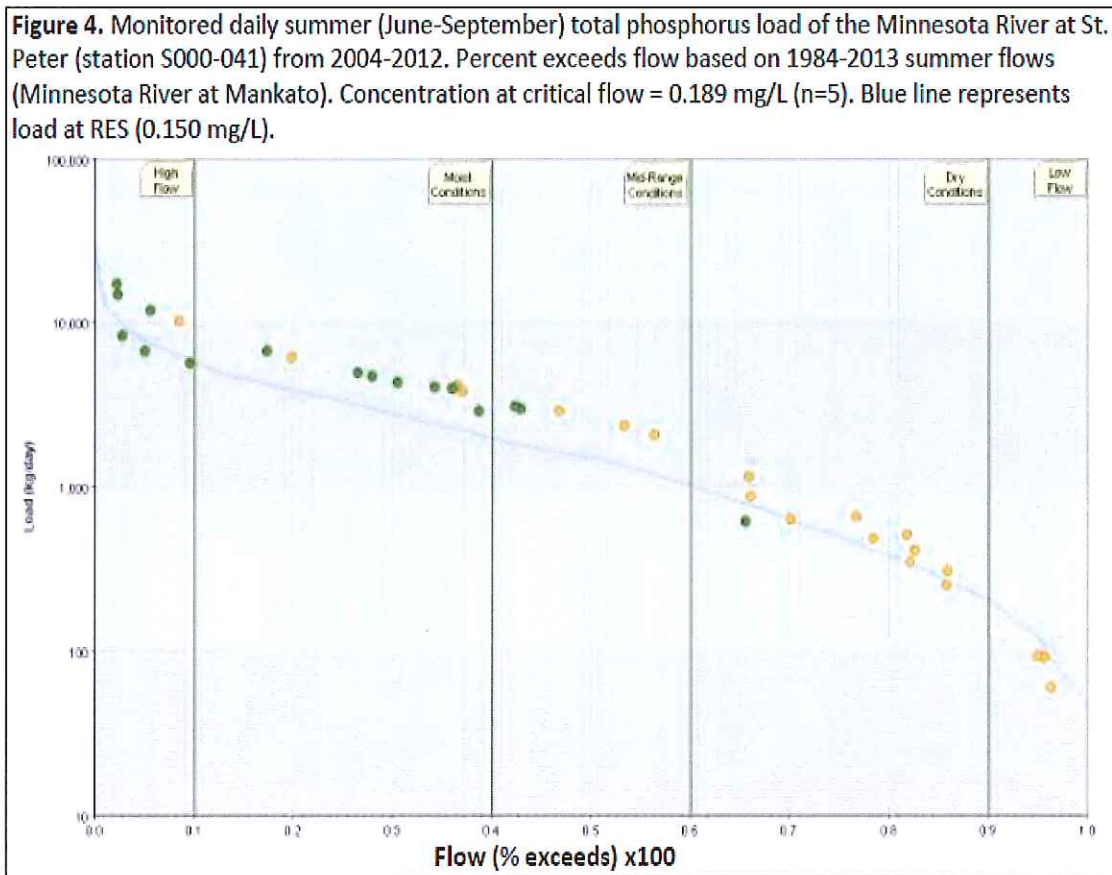


Figure 4 (Effluent Limit Review at 6)

As indicated by these loading compliance analyses, the applicable RES TP criterion is eventually met as the river flow decreases and where point sources exert their greatest effect. However, the existing TP condition at these lower flows is presently *better* than that described in the loading graphics created by MPCA. Each of these figures utilize TP load data for periods that start in 2002 or 2004 and end in 2011 or 2012. Over this time period, significant phosphorus reductions have been achieved by permitted dischargers, as illustrated in Figure 5 below.

Figure 5 shows that permitted loads have decreased significantly since 2002 and have achieved the Lower Minnesota River Nutrient TMDL goal in the years 2012 – 2014. These reductions were intended to cause a decrease in algal levels in the Lower Minnesota River at lower flow conditions that were significantly affected by point source loadings. The loading charts presented in the Effluent Limit Review plainly do not represent current conditions as required, which, by rule, must account for existing wastewater plant improvements. *See* Minn. R. 7053.0205, Subp. 7. C.

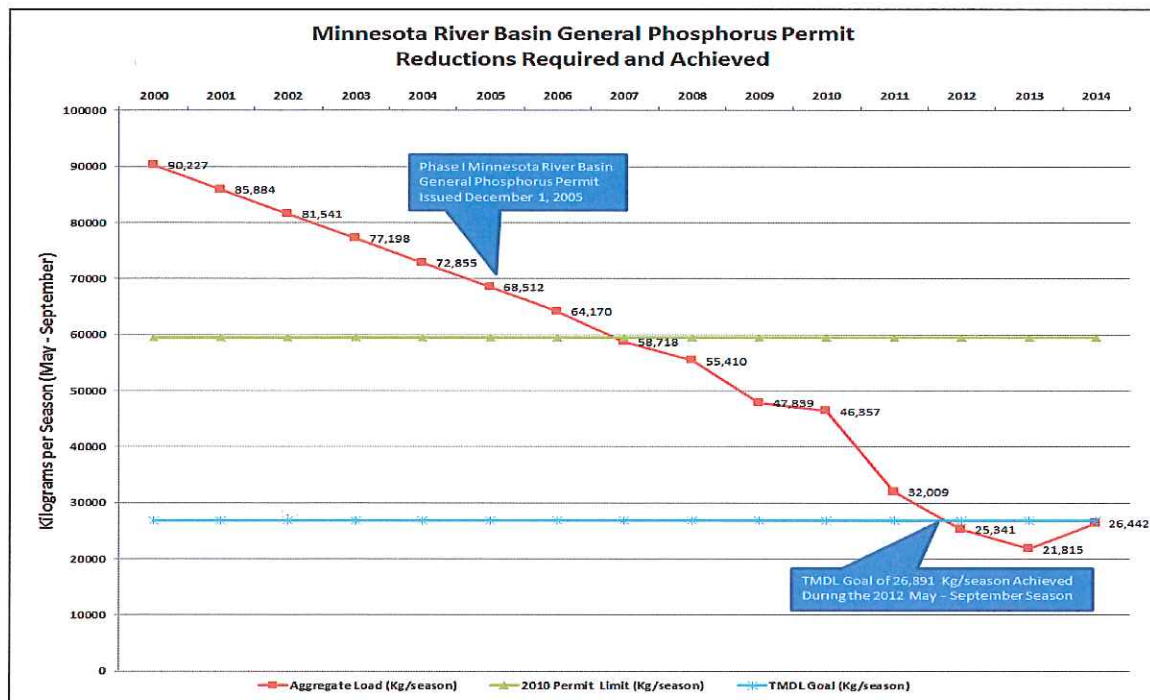


Figure 5

Further, MPCA's current analysis is flawed because it does not account for the other load reductions that will be required to occur upstream of MRVPUC's discharge based on the RES. For example, any discharge that is not directly to the Minnesota River, will be limited by the available dilution and impacts occurring on the tributary stream. This will create far more restrictive limitations for many operations. Federal rules, 40 CFR 122.44(d), require consideration of these load reductions in setting limits on downstream facilities. Unless and until MPCA accounts for these situations upstream of the MRVPUC discharge, it cannot rationally conclude that MRVPUC requires any form of additional TP reduction.

At a minimum, the derivation of permit limits should be based on current information that reflects the actual point source loading to the river and the data should be adjusted to reflect the point source load reductions that have and will be achieved.

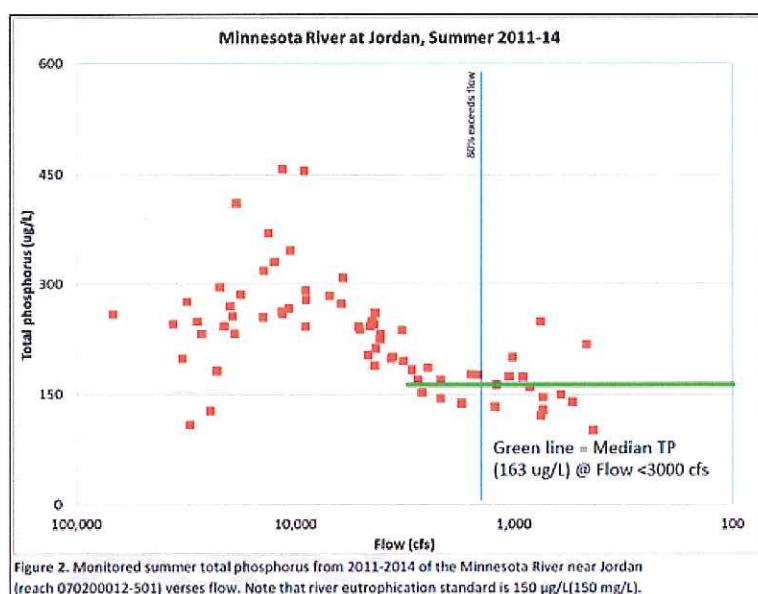
4. The RES, as applied in this case are arbitrary and capricious and a site specific approach is need to address eutrophication in the Minnesota River Basin.

The stated purpose of the RES is to prevent excessive algal growth in rivers and streams due to elevated nutrient (phosphorus) levels. Minn. R. 7050.0222, Subps. 2b(D), 3b(D), 4b(D). Therefore, to justify additional phosphorus limits in NPDES permits, the Agency must demonstrate a causal relationship between point source phosphorus loading and algal growth (measured as chlorophyll-a or "chl-a" for purposes of the RES). See Minn. R. 7050.0150, Subp. 5 (stating "a finding of an impaired condition must be supported by data showing elevated levels of nutrients . . . and at least one factor [i.e. chl-a] showing impaired conditions *resulting* from

nutrient overenrichment”) (emphasis added); *see also* Minn. R. 7050.0150, Subp. 1; Minn. R. 1400.2070, Subp. 1; Minn. R. 1400.2070, Subp. 1.

a. *Point source dischargers are not causing RES total phosphorus exceedances.*

The data presented for the Minnesota River at Jordan from Figure 2 of the Effluent Limit Review show that the RES TP criterion was, for all practical purposes, achieved for river flows at or below the 70-80% exceeds flow when point source loads were significantly higher than they currently are. As demonstrated by the figure below, using more recent data the average instream TP level is approximately 160 µg/l, for stream flows below 3000 cfs (*See Appendix Item B, MPCA response to City of Mankato comments including recent data from the Minnesota River*).



(Figure 6)

Under this lower TP level, algal levels should be reduced, if the RES’ “conceptual model” is accurate for the Minnesota River system. However, for these lower flow conditions, the associated algal levels are far in excess of the RES criterion – averaging approximately 110 µg/L when RES TP criterion is met. This confirms that attainment of the chlorophyll-a objective, during lower flow conditions is not possible, even though the RES TP criterion is achieved. Likewise, for flows in excess of 3,000 cfs where the RES TP criterion is exceeded (ranging 160 – 450 µg/l), algal levels are greatly reduced, despite *increasing* TP levels. This indicates that a RES impairment listing and further point source control of TP in this system is not justified. The system is simply not responding as the adopted rule claimed should occur.

For the Minnesota River at Jordan, the 80% exceeds flow is 1,420 cfs (~ 920 MGD) (the focus of Effluent Limitation Analysis). At this flow, compliance with the RES TP criterion (0.150 mg/L) is apparent even from the older datasets and is equivalent to a loading rate of 521 kg/day. By comparison, point source dischargers contribute 201 kg/day on average for the 2012 – 2014

summer season. At the median flow (>6,000 cfs) the actual TP load is thousands of kg/day in excess of the RES' TP criterion, due to non-point loadings. Thus, even if the permitted dischargers were completely removed, the river cannot possibly achieve the TP standard on the average summer season flow. Consequently, regulating NPDES permittees with more stringent TP limits will not achieve meaningful algal or nutrient reductions in the Minnesota River and is unwarranted given that standards are met for conditions the MPCA considers significantly affected by point sources and unachievable when point source loads are irrelevant. As discussed further below, it is apparent that application of the RES in point source permitting will lead to arbitrary and unnecessary nutrient load reductions. Thus, as applied, the RES are arbitrary and capricious.

b. *Additional point source TP control will not achieve the RES.*

The RES represent long term summer season average conditions used to assess use attainment. Based on the past 30 years of record, the long-term summer season average flow is about 7,800 cfs with a median summer average flow of 6,600 cfs. At these flows, point sources make up less than 4% of the observed TP load. Even if all 200 kg TP/day from the point sources were somehow removed, the long term average TP concentration will still far exceed the RES TP criterion.

c. *The conceptual framework upon which the RES relies is invalid for the Minnesota River.*

The entire premise for the RES is that increasing concentrations of total phosphorus will cause excessive/increasing algal growth and the water quality problems associated with such growth (elevated BOD₅, dissolved oxygen flux, and pH). A review of the available data for the Minnesota River (at Jordan) shows that this premise is not valid. Water quality data for the summer season, from 2011 – 2015, show that sestonic chlorophyll-a concentration is *inversely* related to TP concentration (i.e., as TP *increases*, algal levels *decrease*).

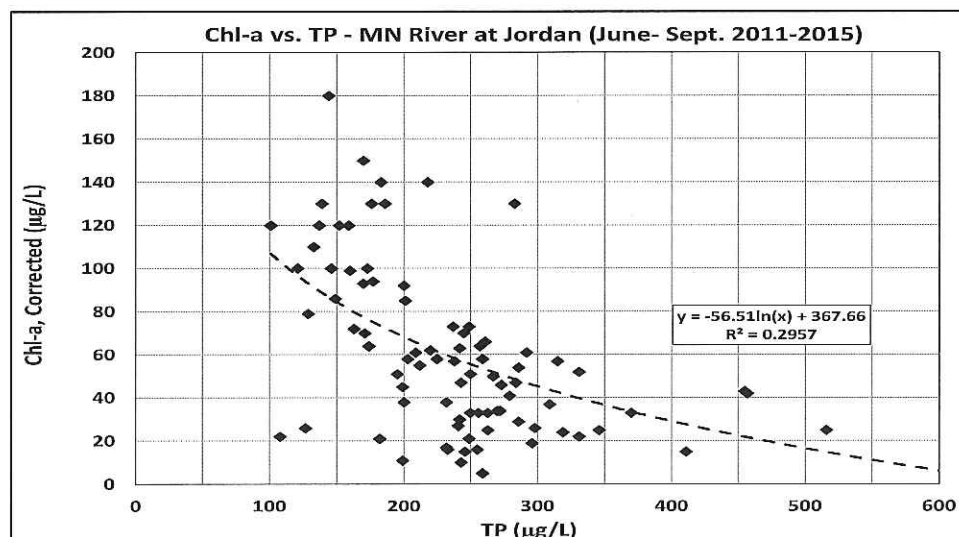


Figure 7

Although the coefficient of determination (R^2) for this relationship is not very strong, the pattern of response is quite clear. Apparently, conditions in the Minnesota River that cause high phosphorus to exist do not concurrently allow high chlorophyll-a to exist. This confirms that other factors (e.g., detention time, light penetration) that occur coincident with higher TP levels are exerting a controlling influence on the chlorophyll-a response. If the chlorophyll-a response is compared against river flow, a much stronger relationship is revealed.

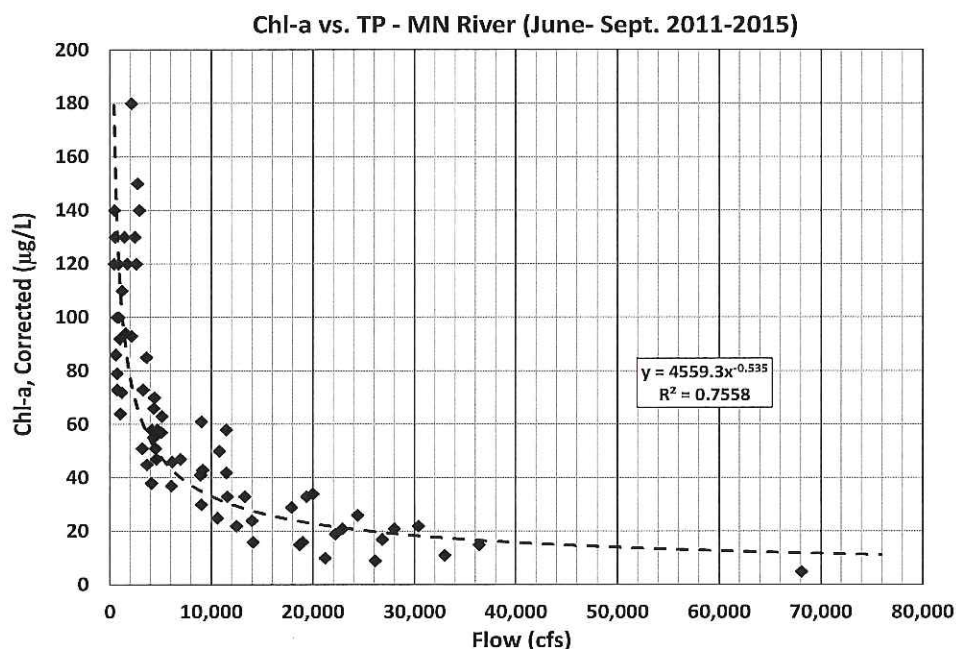


Figure 8

This strong relationship shows that summer chlorophyll-a concentrations are strongly influenced by flow, with the highest concentrations occurring at the lowest flows. Somewhere below 3000 cfs (when TP levels are lowest), the system algal growth response becomes asymptotic.

Data collected by the City of Mankato in 2016 (10 samples collected between June 22 and August 24) and shared with MRVPUC further support this finding and suggests a possible reason for this relationship. The figure below shows that phosphorus and turbidity are positively correlated with increasing flow, while sestonic chlorophyll-a is negatively correlated. This, of course, would mean that light needed to support increased plant growth becomes less available, as nutrients become more available. However, since both light and nutrients are needed to sustain plant growth, algal levels simply cannot increase under these conditions.

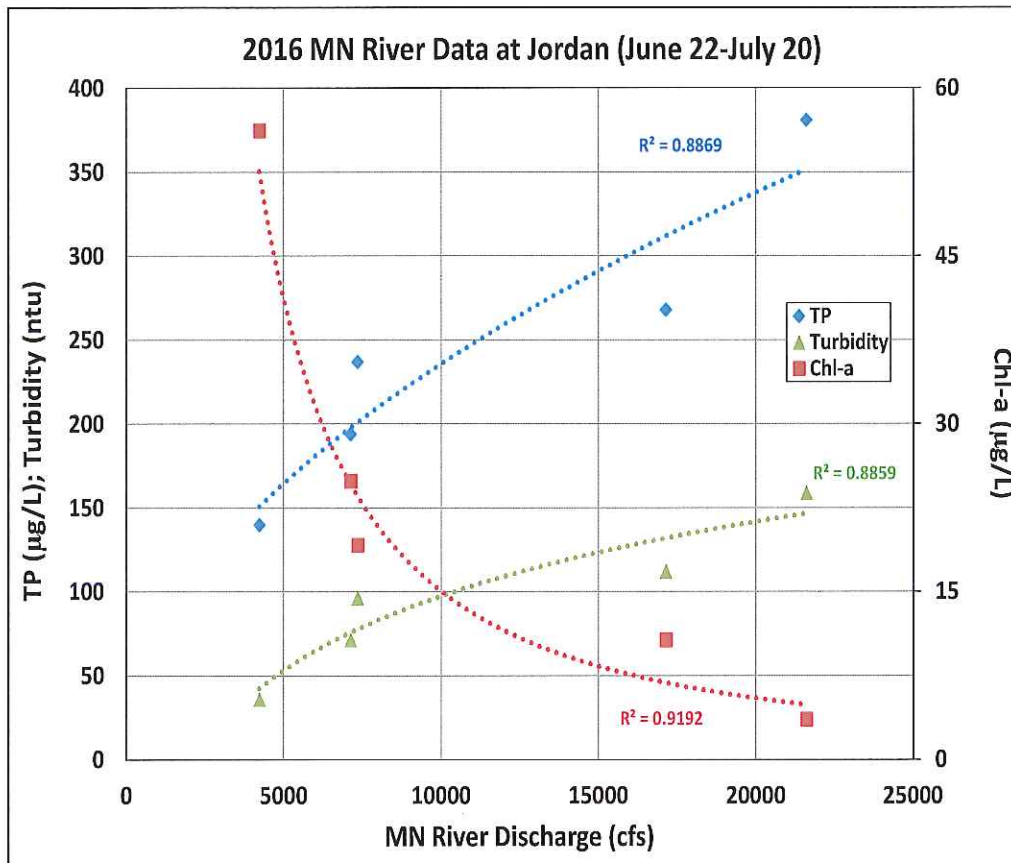


Figure 9

If the chlorophyll-a results are regressed against the turbidity data, the following relationship is obtained.

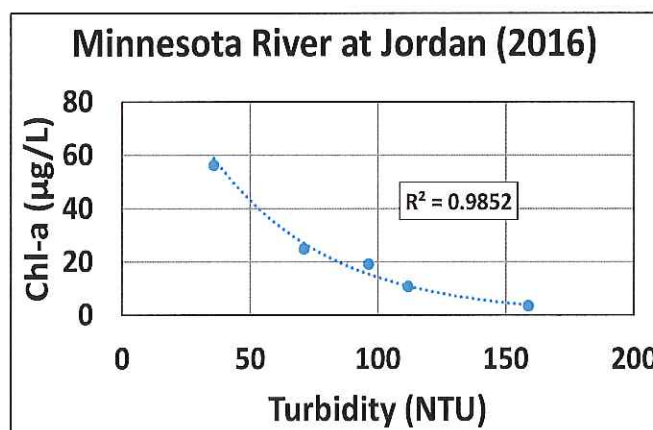


Figure 10

The coefficient of determination for this relationship is very strong and suggests that the chlorophyll-a response in the Minnesota River is driven primarily by turbidity level. This should

not be a surprise, as turbidity controls light penetration – a primary factor that controls whether or not plant growth can occur (i.e., no light, no plants).

The corresponding relationship between TP and turbidity also shows a strong correlation as illustrated below. When the TP concentration is low, turbidity is low, but when turbidity increases, the TP concentration also increase. This indicates that the TP occurring at higher flows is primary particulate (i.e., associated with bed load or eroding soils).

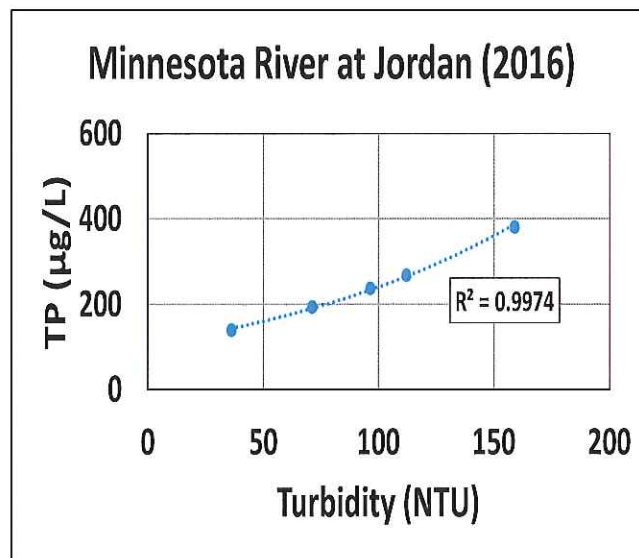


Figure 11

Taken together, these relationships show that chlorophyll-a levels decrease as TP concentrations increase because high TP can only occur in the presence of elevated turbidity.

In summary, it is clear that (1) point source TP loads are not causing RES impairments on the Minnesota River; (2) additional point source reductions in TP loading will not lead to RES attainment; and (3) the Minnesota River does not conform to the conceptual framework upon which the RES relies. Therefore, as applied, the RES are arbitrary and capricious and a site specific standard is required to effectively address eutrophication in the Minnesota River.

5. BOD data indicate RES compliance providing further evidence that additional reductions from MRVPUC are unnecessary.

BOD is a pivotal response criterion for the RES. The figure below, provided by MPCA (*see* Appendix Item B) illustrates BOD data for the Minnesota River at Jordan.

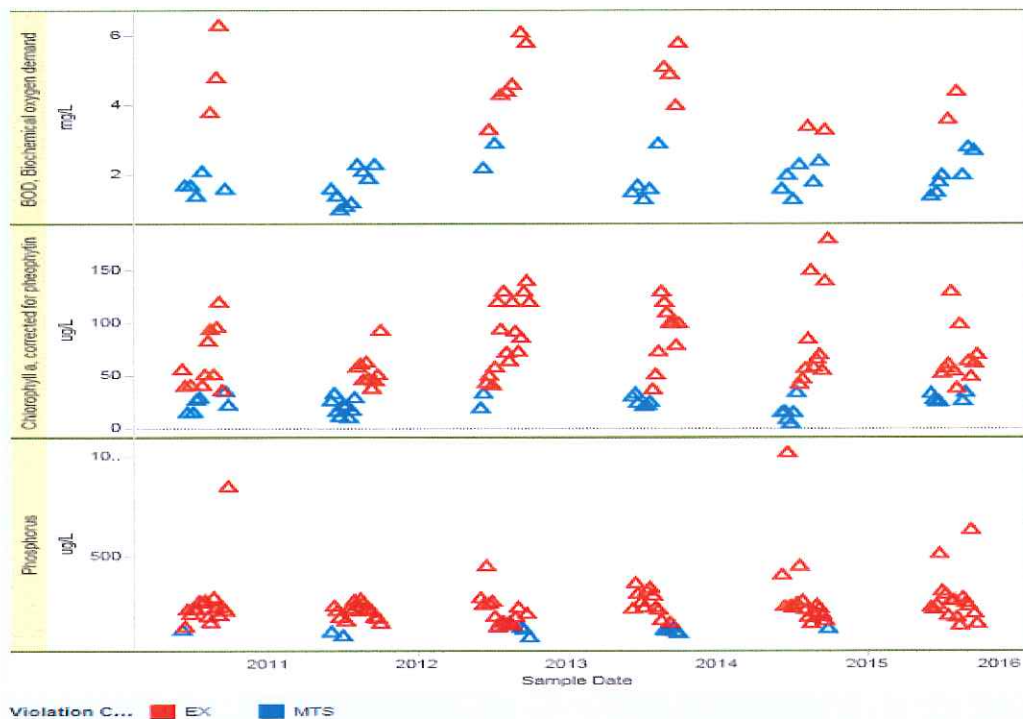


Figure 3. Monitored total phosphorus concentration of the Minnesota River near Jordan (reach 070200012-501).

Figure 12

In accordance with MPCA guidance, the data for each summer season should be averaged and then compared to the ≤ 3.0 mg/L BOD₅ RES criterion to determine compliance. From these data, it is clear that 2010, 2011, 2014, 2015, and possibly 2013 meet the BOD RES threshold. Four (or five) of the past six years meet the RES threshold, indicating compliance with the BOD RES criterion.

The RES criteria derivation was premised on an alleged effect of BOD₅ concentration on aquatic life (i.e., % Darter Individuals). Based on this relationship, BOD₅ thresholds were established. Chlorophyll-a thresholds were established using a regression between BOD₅ concentration and chlorophyll-a, then the TP threshold was established using a regression between chlorophyll-a and TP (See, Figure 49 from the 2013 Draft RES Criteria, at 76, available at <https://www.pca.state.mn.us/sites/default/files/wq-s6-08.pdf>).

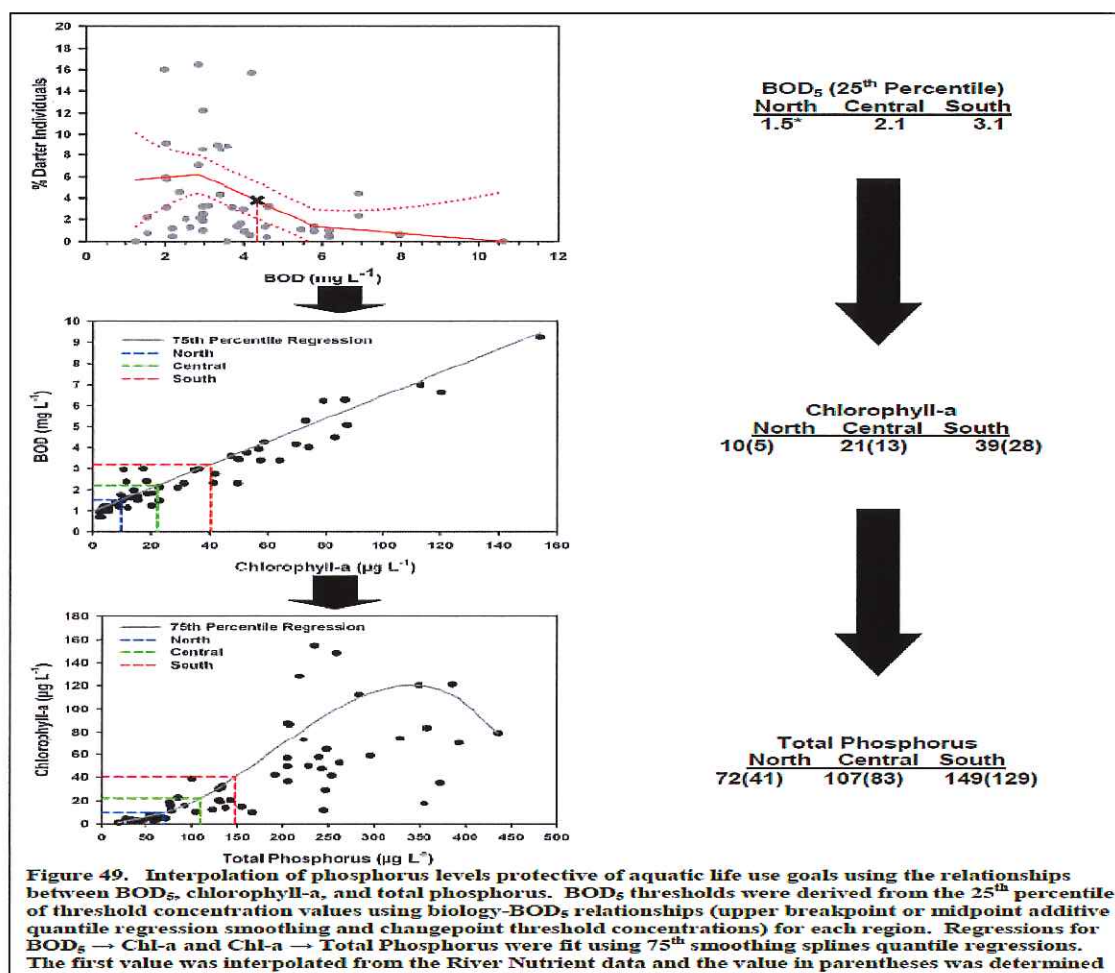


Figure 13

Based on this framework, without a RES BOD₅ criterion exceedance, the remaining RES criteria are irrelevant with respect to aquatic life use impairment. The data presented above for BOD₅ concentrations in the Minnesota River at Jordan show that the RES BOD₅ criterion is not exceeded on the long term average. Consequently, based upon MPCA's analyses that formed the basis for the RES, aquatic life uses are not impaired and the river should not be identified as impaired pursuant to the RES.

6. The use of BOD₅ and DO flux as primary response variables for purposes of indicating impairments is not scientifically sound.

Significant new evidence has come to light since the MPCA formally adopted the RES on June 24, 2014 which demonstrates that neither BOD₅ nor DO flux are reliable indicators of nutrient impairment. First, a memorandum published on November 19, 2014 by the *Standard Methods* joint editorial board, the very experts responsible for the development and use of the BOD₅ test incorporated by MPCA into the RES, expressly confirmed that it is improper to use BOD₅ as an impairment response criterion for nutrients. See Appendix Item C. Second, the USEPA

confirmed in its responses to several Freedom of Information Act (FOIA) requests between September 12, 2014 and December 5, 2014, that, among other things, it did not have any records concerning the use of BOD₅ as a nutrient response criterion or which supported using DO flux (divorced from minimum DO) as a response variable for identification of nutrient impairment. See Appendix Item D.

In Minnesota, the MPCA is entrusted with the authority “to establish and alter such *reasonable* pollution standards for any waters of the state in relation to the public use to which they are or may be put as it shall deem necessary for the purposes of this chapter” Minn. Stat. § 115.03, subd. 1(c) (emphasis added). Federal law also requires that the adopted numeric criteria be based on “sound scientific information.” 40 CFR 131.5(a)(2). Minnesota rules of evidence prevent the admission of results from a scientific test that was not correctly applied or not intended to demonstrate a scientific/factual issue. See *Goeb v. Tharaldson*, 615 N.W.2d 800, 810 (Minn. 2000) (in order for scientific evidence to be admissible “[t]he scientific technique must be generally accepted within the relevant scientific community, and the particular evidence introduced must have a scientifically reliable foundation”). *A fortiori*, the RES should not be allowed to misapply the BOD₅ test or DO flux criterion to predict nutrient impairments when such criteria is not capable of accurately predicting nutrient impairment.

Conclusion

Based on the foregoing, MRVPUC objects to the proposed 5.4 kg/day (calendar month average June – September) total phosphorus effluent limit in its draft NPDES permit.

Thank you for your consideration of this comment letter. If you have any comments or questions please address them to MRVPUC’s attorney in this matter, Daniel Marx at dmmarx@flaherty-hood.com or 651-225-8840.

Sincerely,



Jeffery Kerkow
Chairman, MRVPUC

cc: Mayor Robert Broeder, City of Le Sueur
Mayor Paul Menne, City of Henderson
Jasper Kruggel, Public Service Director, City of Le Sueur
Wendy Turri, Minnesota Pollution Control Agency, Section Manager
Steven Weiss, Minnesota Pollution Control Agency, Effluent Limits Unit
Jean Coleman, Attorney, MPCA Legal Services Unit

(Appendix)

September 13, 2016

VIA EMAIL AND U.S. MAIL

Commissioner John Linc Stine
Minnesota Pollution Control Agency
520 Lafayette Rd N
St. Paul, MN 55155
John.Stine@state.mn.us

RE: MPCA Utilization of RES Implementation Procedures Contrary to Rule

Dear Commissioner Stine:

I am writing on behalf of the Minnesota Environmental Science and Economic Review Board (“MESERB”) to make you aware of our concerns regarding the Minnesota Pollution Control Agency’s (“MPCA” or “Agency”) implementation of the River Eutrophication Standards (“RES”) pursuant to a guidance document entitled Procedures for implementing eutrophication standards in NPDES wastewater permits in Minnesota (November 2015) (hereinafter, Procedures Document).

MESERB and the MPCA have significant disagreement regarding the scientific basis of the RES. However, despite our disagreements you and your staff have displayed a continued openness to meet with MESERB members, engage on a variety of issues, and listen to our concerns—and we appreciate your Agency’s willingness to do so. At our last meeting you expressed a desire for there to be more upfront and proactive communication between MESERB members, Agency staff and yourself. It is in that spirit that I write this letter to raise our concerns regarding the implementation of the RES.

As you are aware, MESERB participated extensively in the review and adoption process for the RES. Throughout that process we raised concerns regarding the proper use and application of the RES. Throughout the process MPCA assured all parties that the criteria were, unlike the lake eutrophication standards, intended to apply as long term average conditions, based on representative data collected during the algal growing season – June through September. MPCA adopted rule clarifications to ensure that all parties understood that compliance with the criteria was not mandated under rare low flow conditions typically used to evaluate compliance for other chronic and acute criteria. In fact, MPCA recently defended a challenge to its RES criteria approach, clarifying that compliance with the criteria is based on long term average conditions, not short term, or infrequent low flow conditions. *Minnesota Ctr. for Envntl. Advocacy v. Minnesota Pollution Control Agency*, No. A15-1622, 2016 WL 3223177, at *1 (Minn. Ct. App. June 13, 2016).

It is well understood that criteria must be applied consistent with the manner in which they were derived to ensure the proper application of the intended level of protection. As discussed below, despite the MPCA adoption and EPA approval of the criteria as long term averages to be

implemented based on long term growing season average flow conditions, the Agency has inexplicably begun to implement the criteria under short term, rare low flow conditions when deriving NPDES permits. *See generally*, Procedures Document.

This present “guidance” document being utilized by the MPCA effectively amends the adopted RES by creating a far more restrictive set of short term, rare conditions for assessing point source compliance with the RES. This procedure, through mandating a compliance evaluation using a set of rare flow conditions for both rivers and WWTFs, effectively converts the adopted long term average condition into one that occurs infrequently, if ever. This procedure leads to effluent limit restrictions for WWTFs that are far more restrictive than necessary to protect water quality, thereby inefficiently allocating limited clean water resources that could be put to use elsewhere to more effectively protect Minnesota’s precious water resources.

We understand that MPCA is now using this procedures manual broadly in the NPDES program to implement the RES. Because it is unlawful under both state and federal law to adopt methods that effectively amend standards to be more restrictive, without public notice and comment rulemaking, MESERB requests that MPCA promptly rescind the RES Procedures Document and issue guidance that evaluates RES and NPDES permit compliance under long term growing season average conditions.

If MPCA fails to properly and promptly undertake this necessary action, MESERB will work with other municipal organizations to consider options for legal action to enjoin the Procedures Document from further application through the legal process. We hope and trust that this will not become necessary given the clear documentation that the RES are required to be evaluated under long term average conditions pursuant to applicable law.

- **Background on MPCA RES Implementation in NPDES Permit Derivation Following Adoption of the RES**

A prime example of the misapplication of the RES criteria is demonstrated by “The Phosphorus Effluent Limit Review: Minnesota River Basin memorandum”, prepared by Dennis Wasley on April 2, 2015. This document presents an evaluation of compliance requirements to meet the RES for the City of Mankato (and others on the Minnesota River). This analysis uses procedures that were subsequently documented in MPCA’s Procedures Document. The memorandum and the Procedures Document use the 80% exceeds *daily low flow* in the Minnesota River along with the 70% AWWDF (*average wet weather design flow*) as the basis for calculating available assimilative capacity to meet the RES and establishing wasteload allocations to comply with total phosphorus water quality standards in the RES. As discussed herein, these procedures are inconsistent with the regulatory requirements set forth in the Minnesota Administrative Rules (Minn. R. 7050.0150, 7050.0222, and 7053:0205).

- **Administrative Code**

The Minnesota Rules set forth the requirements for waters of the state to be considered impaired or not impaired. For example, Minn. R. 7050.0222, Subp. 2, establishes eutrophication standards for Class 2A rivers and streams. The eutrophication standards for the South River Nutrient Region are:

Phosphorus, total	$\leq 150 \mu\text{g/L}$
Chlorophyll-a (seston)	$\leq 35 \mu\text{g/L}$
Diel dissolved oxygen flux	$\leq 4.5 \text{ mg/L}$
BOD ₅	$\leq 3.0 \text{ mg/L}$

Additional narrative eutrophication standards for Class 2A rivers and streams are found under subpart 2b. Subpart 2b provides the following:

- A. Eutrophication standards for rivers and streams *are compared to summer-average data* or as specified in subpart 2. Exceedance of the total phosphorus levels and chlorophyll-a (seston), five-day biochemical oxygen demand (BOD₅), diel dissolved oxygen flux, or pH levels is required to indicate a polluted condition.
- B. Rivers and streams that exceed the phosphorus levels but do not exceed the chlorophyll-a (seston), five-day biochemical oxygen demand (BOD₅), diel dissolved oxygen flux, or pH levels meet the eutrophication standard.
(Emphasis Supplied)

Summer average is defined (7050.0150 DD) as the representative average of concentrations or measurements on nutrient enrichment factors, taken over one summer season. Summer season is defined as the period from June 1 through September 30 (7050.0150 EE).

When MPCA adopted the RES, it also adopted rule language to guide implementation of the total phosphorus (“TP”) water quality based effluent limits (“WQBELs”) for the eutrophication standards. Minnesota Rule 7053.0205, Subp. 7.C, provides the following:

Discharges of total phosphorus in sewage, industrial waste, or other wastes must be controlled so that the eutrophication water quality standard *is maintained for the long-term summer concentration of total phosphorus, when averaged over all flows*, except where a specific flow is identified in chapter 7050.

(Emphasis added.)

Thus, the adopted criteria are clear on their face – they apply as a long term average of the available annual growing season data, over the entire flow range for the growing season. Thus, if there are two years of representative growing season data and one year exceeds the criteria but the other complies, one would find that compliance “on average” has occurred. Moreover, since riverine

responses to algal growth are flow dependent, and a range of high and low flows occurring over the growing season occurs, compliance should be based on the conditions reflecting the average flow condition for the system over the entire growing season (i.e., the average June to September stream flow). Consequently, one does not assess compliance based on algal growth occurring under the lower flow condition, all flow conditions must be assessed and averaged.

- **RES Procedures Document**

These regulatory requirements are echoed in the “Background” section of the RES Procedures document, wherein it provides:

“The frequency and duration of RES are unique from most of Minnesota’s water quality standards. The RES are based on a long-term summer average concentrations over multiple years instead of a “do not exceed” threshold common with toxic pollutants.”

(Procedures Document at 5.)

The Procedures Document, however, does not specify a long-term summer average flow for RES calculations. Using a mass-balance approach to calculate the WLA, the Procedures Document uses the 80% exceeds single day low flow and the 70% AWWDF (Procedures Document at 8, 13). The combination of these conditions (low dry weather stream flow and wet weather plant flow) is not evaluated in the guidance, but one would expect it to be a very rare, if not almost an impossible combination of conditions to occur simultaneously.

The Procedures Document presents a mass-balance approach to developing a summer season wasteload allocation (WLA).

Equation 3. General mass balance equation for WLA (some terms of equation defined in previous section)

$$WLA_c = \frac{(RES * (Q_s + Q_e) - (Q_s * C_s))}{Q_e}$$

WLA_c = Wasteload allocation concentration in (mg/L). Can be translated to mass based on Q_e and WLA

RES = Total phosphorus river eutrophication standard.

(RES Procedures at 18)

In Equation [3], C_s is defined as the 80% exceeds flow for the receiving water and Q_e is defined as 70% of the AWWDF.

- **Evaluation of RES WQBEL Procedures**

The use of these prescribed flows in Equation [3] results in a calculated assimilative capacity and wasteload allocation that is far less than the RES requires under growing season average flow conditions and is therefore incongruent with the plain language of the adopted rule. The rule is expressly described as a summer average condition and the RES Procedures further explain that the RES are based on a long-term summer average over multiple years. This would indicate that a river could exceed the RES every other year on average and still meet the criteria (i.e., an exceedance frequency of once every two years). Consistent with the rule language referenced earlier, this interpretation properly is less stringent than USEPA's criteria for toxic substances, which are generally specified with a once in three year exceedance frequency. However, even if we presume that MPCA's intent was to meet the more stringent exceedance frequency for toxics (growing season average may only exceed the criteria once every three years (i.e., compliance occurs 2/3 of the time), the Agency's Procedures Document is still far more restrictive than the intended exceedance frequency (on long term average) and the plain language of the rule because of the rare conditions selected for the NPDES compliance analysis.

An evaluation of summer average flows (June – September) and 80% exceeds flow for the Minnesota River near Jordan, as presented in the April 2, 2015 memorandum from Dennis Wasley, shows that these flows are vastly different (See, Figure 1). The 80% exceeds *daily* summer low flow for the most recent 30 year period (1986 – 2015) is 1,420 cfs. This flow is much lower than the median summer flow (6,598 cfs) or the arithmetic average flow (7,778 cfs) that the rule expressly states compliance is based upon.

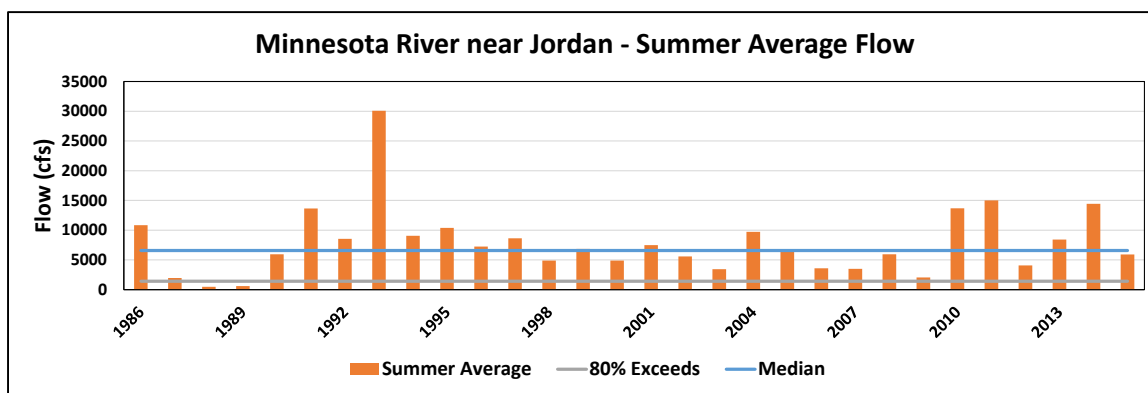


Figure 1

In fact, when applied as a growing season average flow, the 80% exceeds daily summer low flow (1,420 cfs) has a return frequency of 14 years (Figure 2) for the 30-year period of record as evaluated using the Log Pearson Type III method. Because the RES are based on a long-term summer average concentration, it is plainly inappropriate to use the 80% exceeds single day low flow as the basis for calculating wasteload allocations for RES compliance. *This analysis produces*

an allowable assimilative capacity that is about seven (7) times more restrictive than necessary to achieve standards compliance.

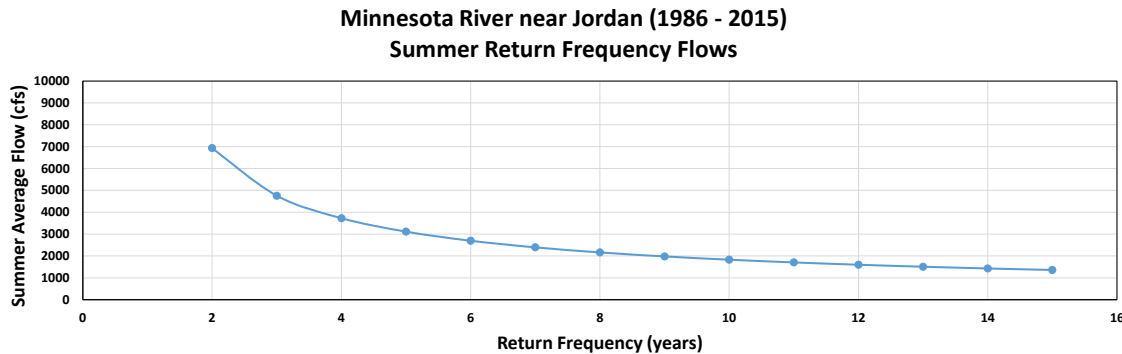


Figure 2

Equation [3] also uses the 70% AWWDF in the wasteload allocation. It is not apparent that this flow is an appropriate indicator of the average effluent flow during the summer. The Procedures Document indicates:

To expect AWWDF from facilities at the 80% exceeds summer flow is unrealistic. For municipals WWTFs, “ Q_e ” is equivalent to 70% of AWWDF which is often similar to average dry weather design flow (ADWDF) for municipal WWTFs.

(Procedures Document at 14)

It is apparent from this statement that the intent is to select a WWTF flow that is expected to occur over the summer period. There is no basis to claim that the WWTF summer average flow will be 70% of the AWWDF. As noted in the quote, Q_e is often similar to the ADWDF, but this only applies to facilities that are operating near their design flow. For facilities that have not reached their design flow, this approach grossly over-estimates the effluent flow and yields a concentration limit that is unnecessarily stringent. Moreover, it is not apparent how one could expect a single day wet weather flow to occur over an entire growing season, while the selected river flow is representative of dry weather conditions. The proper flow to utilize would be the expected average growing season WWTF flow, under an average rainfall year.

Thus, the methods used to evaluate RES compliance and to establish permit limits do not properly implement the adopted long term summer average objectives of the Procedures Document and are, therefore, inconsistent with applicable Minnesota state laws and regulations.

- **Conclusion**

The Procedures Document at issue specifies an alternative approach for developing wasteload allocations that is inconsistent with and far more restrictive than the rules, as adopted, at Minnesota

Rules 7050.0150, 7050.0222 and 7053.0205. The RES Procedures document constitutes an improper rule amendment under Minnesota law and may not be used as a basis for establishing how the adopted WQS will be implemented under the applicable federal rules governing NPDES permit derivation (See 40 CFR 122.44(d) and 40 CFR 131.21; 131.20). The document has not undergone formal notice and comment rulemaking procedures, or EPA approval as a WQS amendment prior to its imposition on the regulated community. Therefore, MESERB respectfully requests that MPCA immediately discontinued the use of this document as the basis for setting effluent limits to meet the RES.

Because this matter is of significant and immediate importance to MESERB members and the use of the Procedures Document has an ongoing impact on wastewater permits throughout the state, we ask that the Agency respond to this request within the next forty-five (45) days.

If you have any questions on the information provided above please contact me at (218) 299-5386 or via email at andy.bradshaw@ci.moorhead.mn.us or contact MESERB's legal counsel, Daniel Marx, at (651) 225-8840 or via email at dmmarx@flaherty-hood.com.

Yours truly,

MINNESOTA ENVIRONMENTAL SCIENCE AND ECONOMIC REVIEW BOARD

Andy Bradshaw, Operations Manager
Moorhead Waste Water Treatment Facility
MESERB President
City of Moorhead
500 Center Avenue, Box 779
Moorhead, MN 56560

cc: John Linc Stine, Commissioner, MPCA
Rebecca Flood, Assistant Commissioner, MPCA
Mark Schmitt, Municipal Division Director, MPCA
Shannon Lotthammer, Environmental Analysis & Outcomes Division Director, MPCA
Katherine Neuschler, Water Assessment Section Manager, MPCA
Steven Weiss, Effluent Limits Unit Supervisor, MPCA
Jean Coleman, Attorney, MPCA
Joel Peck, Municipal Liaison, MPCA
John Hall, Hall & Associates
MESERB members

Response to city of Mankato comments

Question 1: Are recent total phosphorus levels meeting the growing season average of river eutrophication standards.

Response 1: The load duration curve is simply a graphic to display when the concentration exceeds the standard across all summer flow ranges of a given river reach. The MPCA has calculated the summer averages for river eutrophication standards (RES) in all reaches of the Minnesota River that had more than 12 samples over 2 summers. The reaches on the Minnesota River discussed in this response document had robust RES monitoring for the past 10 years. More recent data will be discussed throughout this response to comments document.

All four monitored reaches of the Minnesota River downstream of the Mankato WWTF with sufficient RES sampling exceed river eutrophication standards for total phosphorus and chlorophyll-a. A statewide assessment for river eutrophication standards was completed in the fall of 2015. A public notice period for the 303(d) list of impaired waters will happen this summer. Calculations were based on summer average values from 2005-2014. The closest reach to the Mankato WWTF with sufficient data was reach 07020007-501 near St. Peter. As noted by the city and MPCA, concentration of TP has been reduced at low flow compared to historical periods before 2000 when TP removal was not an emphasis of WWTF operators in the Minnesota River Basin. The reductions at low flow have not been sufficient to drop the summer average TP below the RES criterion of 150 µg/L.

The most robust monitoring station for RES is near Jordan. From 2012-2015, TP averaged 257 µg/L during the summer. TP at this station was close to meeting the RES criterion at the 80% exceeds flow but still exceeded half of the time below the 80% exceeds flow (Figure 2,3). Current discharge from the facilities is Minnesota River General permit is approximately 160 - 175 kg/day. The wasteload allocation for the facilities in the basin permit is 110 kg/day based on the HSPF modeling.

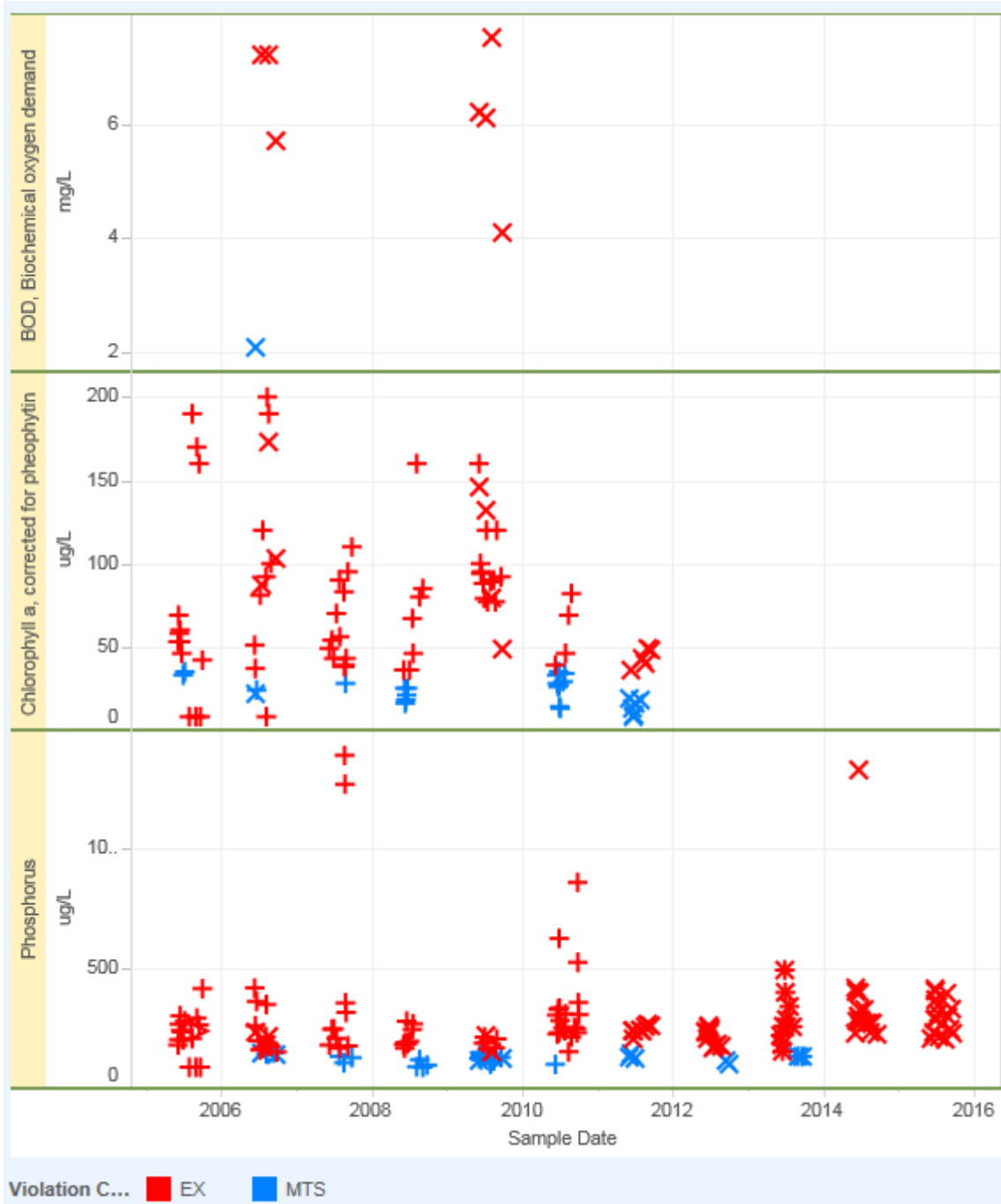


Figure 1. Monitored total phosphorus concentration of the Minnesota River near St. Peter (reach (07020007-501).

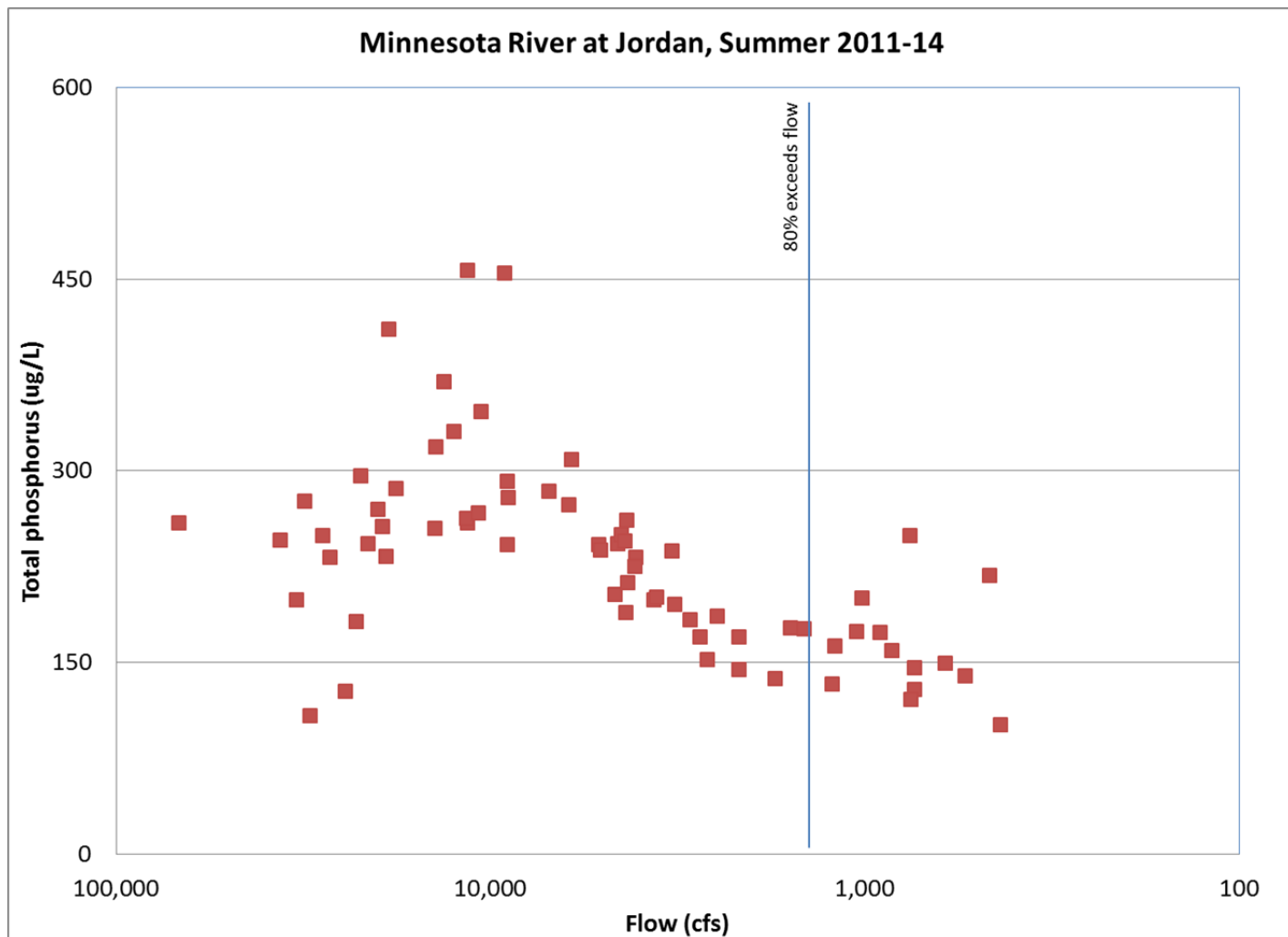


Figure 2. Monitored summer total phosphorus from 2011-2014 of the Minnesota River near Jordan (reach 070200012-501) verses flow. Note that river eutrophication standard is 150 $\mu\text{g/L}$ (150 mg/L).

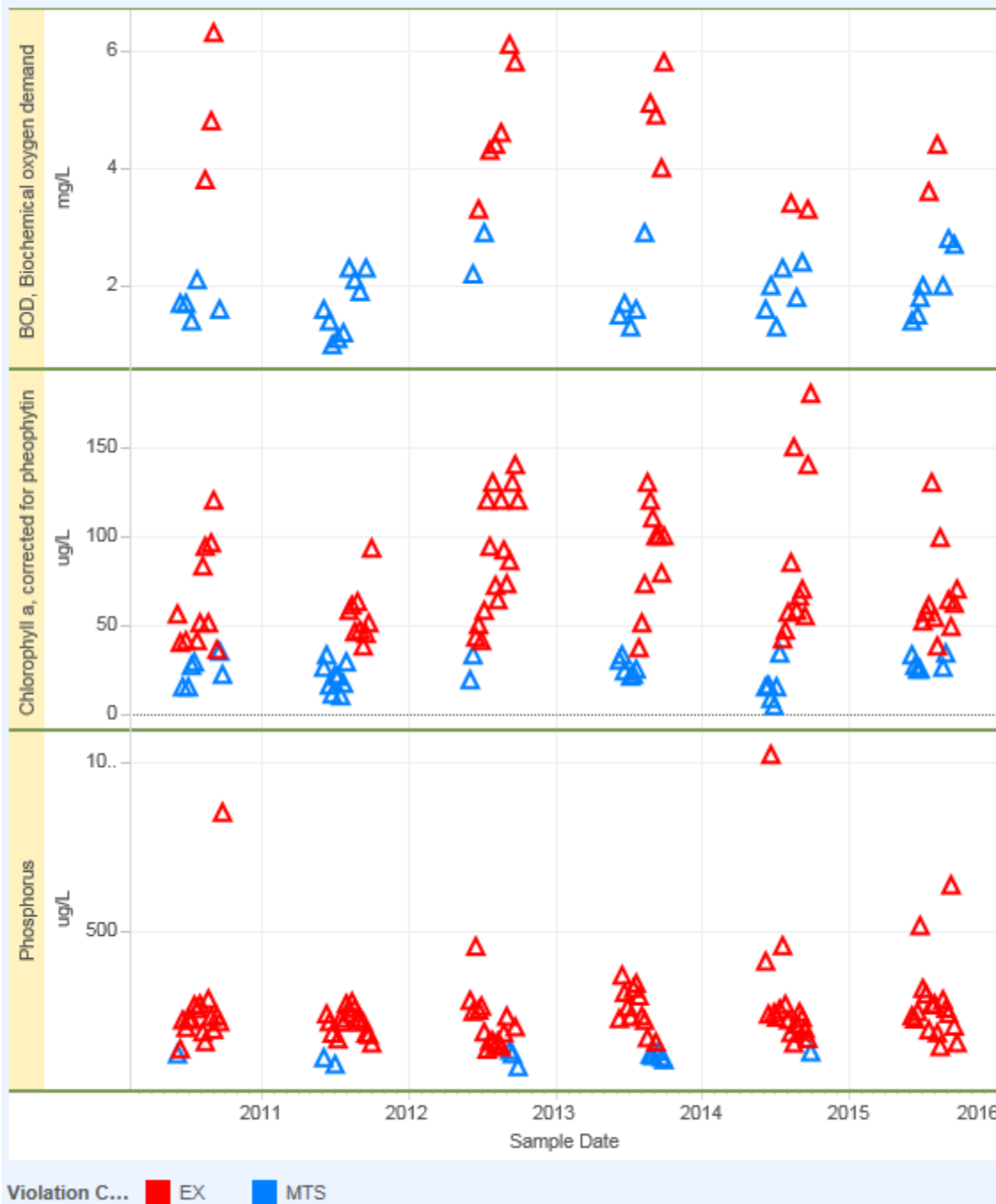


Figure 3. Monitored total phosphorus concentration of the Minnesota River near Jordan (reach (070200012-501).

Question 2: Does MPCA have any analysis that current point source loads are still a significant factor causing the applicable standards to be exceeded.

Response 2: Comparing scenarios “4” and “4a” of the HSPF model is one method to answer this question. It should be noted that the current load of the point sources in the Minnesota River Basin Permit is 160 -175 kg/day which is greater than 110 kg/day for the basin permit facilities in scenario 4. Scenario 4a puts the WWTFs at 0 kg/day. The change of predicted summer average TP values [Table 1 and 4 in Minnesota Basin Memo (Wasley 2016)] indicates that complete removal of WWTFs in the Minnesota River Basin would reduce summer average TP at Jordan and St. Peter. The significance of WWTFs is not what it once was, but the change from scenarios 4 to 4a indicates that the facilities contribute to exceedance of the standards. Thus, the model was used to establish water quality based effluent limits for the WWTFs contributing to the exceedance of RES in the Minnesota River. The MPCA recognizes that non-points sources of are currently the most significant source of TP in the Minnesota River Basin.

The Mankato WWTF also currently discharges above the 150 µg/L (0.150 mg/L) RES TP criterion and the majority of the TP from the WWTF makes it the first downstream reach near St. Peter that exceeds river eutrophication standards. These two simple criteria have been used to determine if a WWTF “contributes” to a downstream eutrophication impaired reach. The MPCA is required to set WQBELs for WWTFs when they contribute to an impairment even if the WWTF is not the most significant source of TP.

The commenter states that the TMDL goals for the Low Dissolved Oxygen TMDL were achieved in 2012. The aggregate wasteload allocation for RES is more restrictive than aggregate wasteload allocation for the low DO TMDL [Appendix E in Minnesota Basin Memo (Wasley 2016)]. Trapping of TP in the Minnesota River is most extreme at 7Q10 flows (roughly 98% exceeds flow) that the low Do TMDL was based on. At these extreme low flows not all of the TP discharged by facilities makes it to the lower Minnesota River. The RES apply to all summer flows not just the most extreme low flows when TP from WWTFs may not be delivered to downstream reaches of concern.

Question 3: Does MPCA agree that current loading data should show better RES compliance under low flow conditions.

Response 3: See the previous two responses. It should also be noted that 2014 and 2015 were not low flow summers. The MPCA does not think that the current load of 160-175 kg/day from the facilities in the Minnesota River Basin Permit is low enough during low flows. The commenter has focused exclusively on TP during low flows. By looking at chlorophyll-a since 2011, it is obvious that current loadings of TP from all sources at low flow are resulting in chlorophyll-a levels well in excess of the chlorophyll-a RES criterion of 35 µg/L (Figure 4).

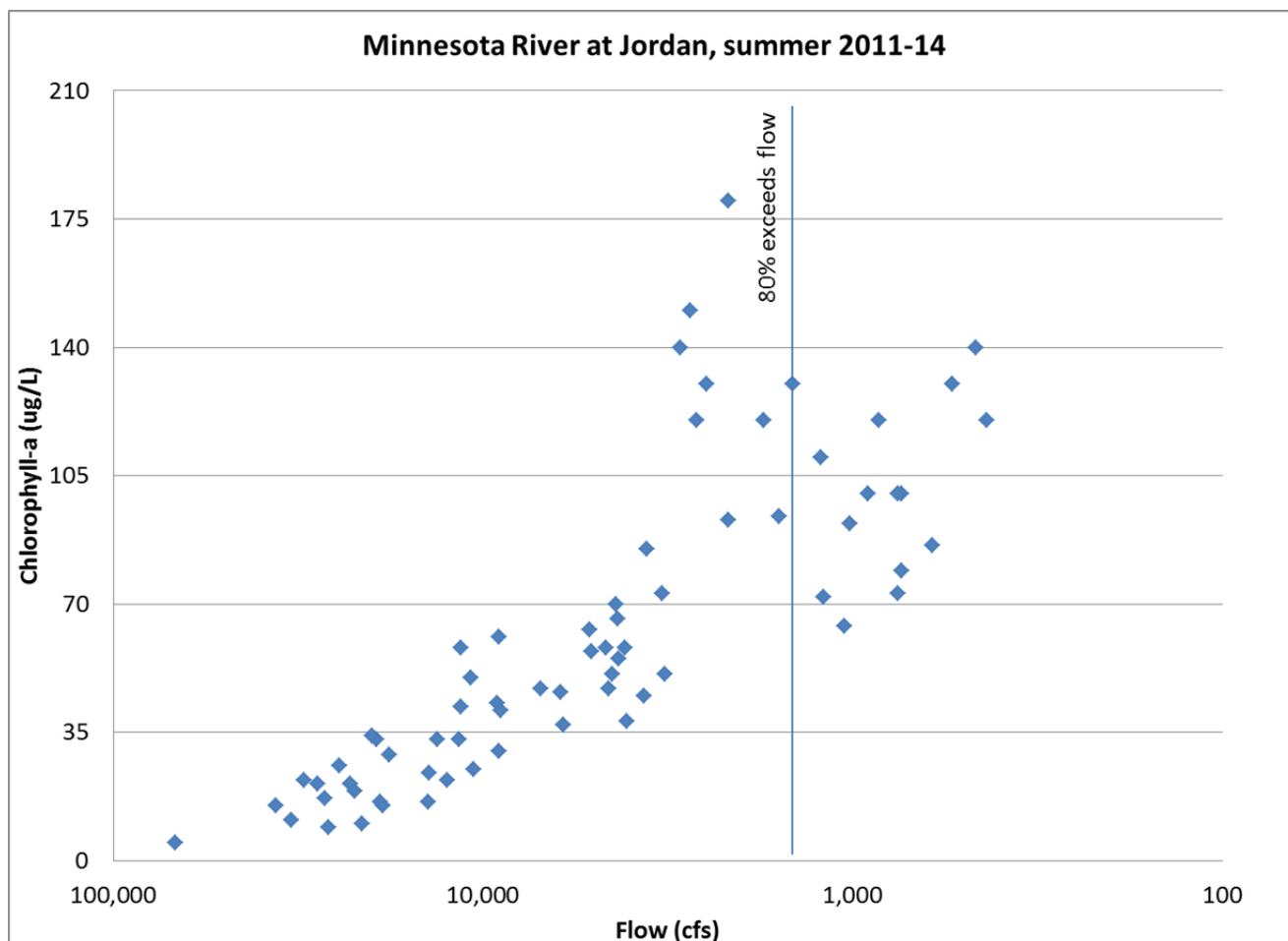


Figure 4. Monitored summer chlorophyll-a from 2011-2014 of the Minnesota River near Jordan (reach 070200012-501) verses flow. Note that river eutrophication criterion for chlorophyll-a is 35 µg/L.

Question 4: Would MPCA consider TP limits that only apply during low flows or on a group allocation basis.

Response 4: The MPCA is currently completing an eutrophication TMDL for portions of the Mississippi River including Lake Pepin and mainstem of the Minnesota River. It would be more feasible to address this question is a TMDL framework rather than an individual permit. It should be noted the limits for RES only apply from June to September.

There are some considerations in the Minnesota River Basin regarding eutrophication standards that may make flow based and aggregate loads difficult. The Minnesota River has multiple draft eutrophication impaired reaches including multiple reaches on the Minnesota River mainstem and several tributaries. This could require different flow ranges for all the downstream surface waters impacted by TP. Given the weather patterns in Minnesota, it is possible that portions of the Minnesota and/or Mississippi Rivers may have high flow conditions while other areas are in average to low flow

conditions. For example, there may be a thunderstorm in the greater Mankato area that increases flows in the Minnesota River while the Mississippi River is at low to average flows. In this example, Pool 2 of the Mississippi River and Lake Pepin would still be at average flows despite increase flows from the Minnesota River. So TP from the Minnesota River facilities could still contribute to algal production in the Mississippi River.

The MPCA is open to TP trading and aggregate limits when possible. Setting aggregate limits for TP in the Minnesota River Basin will be challenging given the large number of draft RES impairments discussed in the previous paragraph. Aggregate limits were simpler when the focus of TP reductions was the outlet of the Minnesota River Basin.

DRAFT



STANDARD METHODS
FOR THE
EXAMINATION OF WATER AND WASTEWATER
JOINT EDITORIAL BOARD
MEMORANDUM

TO: *Standard Methods* Users
Biochemical Oxygen Demand

Andrew Eaton
FROM: Andrew Eaton
Joint Editorial Board

RE: BOD as an Indicator of Nutrient Pollution DATE: November 19, 2014

This letter is in response to questions about the use of the BOD test as a measure of nutrient pollution. The BOD test (Standard Method 5210 B) is not considered to provide an appropriate measure of nutrient pollution nor is it a valid predictor of nutrient impacts. The BOD test is specifically intended to measure oxygen demand due to the biochemical degradation of organic material by microorganisms (bacteria) and includes the oxygen used to oxidize inorganic materials such as sulfides and ferrous iron. The test may also measure the amount of oxygen used to biologically oxidize reduced forms of nitrogen such as ammonia unless an inhibitor is used. Nutrients (N and P) do not exhibit an oxygen demand, per se, and where significant concentrations of viable algal cells are present in a sample, algal induced “BOD” does not represent the microbial degradation of organic substances that the test is intended to measure. Biostimulation tests (*Standard Method 8111*) are better suited to determine the impact of non-carbon nutrients on algal growth than are BOD tests.

Furthermore, the BOD5 test requires the addition of nutrients to the sample as part of the test procedure. This has been shown to be a necessary step to ensure optimum utilization of organic matter by the test organisms in the various dilutions used in the assay. However, the act of adding nutrients to the test bottle further limits the ability to use the BOD5 test as a predictor of non-carbon nutrient loading in a receiving water. This is especially true in view of the fact that phosphate and nitrate are typically the major non-carbon nutrients contributing to stream degradation, and they do not exert any oxygen demand since they are already oxidized to the highest oxidation state of the parent nutrient atoms (N and P).



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 12 2014

OFFICE OF WATER

Alexander J.E. English
Hall & Associates
1620 I Street, NW
Washington, D.C. 20006-4033

Re: Freedom of Information Act Request EPA-HQ-009040

Dear Mr. English:

This letter is in response to the Freedom of Information Act (FOIA) request for public records concerning the Categorization of Diurnal Variation in Dissolved Oxygen (DO) as an Impairment to Water Quality from Hall and Associates, dated July 31, 2014, which asserts that "the Environmental Protection Agency (EPA) has indicated in several forums that a nutrient or aquatic life use impairment may be identified based solely on the degree of DO variation, even where the aforementioned minimum DO concentrations are being met." The request seeks "any records which are the basis for EPA's assertion that diurnal DO variation, by itself, causes aquatic life impairment, including any public notices that EPA has reached this conclusion under Section 304(a) of the Act. In particular, this FOIA response should identify the scientific studies that form the basis for EPA's position and explain the degree of diurnal DO variation that may be expected to cause use impairment, even when DO levels do not fall below the minimum concentrations specified in the Gold Book."

Enclosed you will find a submission of the responsive records for the EPA. This response includes pertinent language from the 1986 document entitled "Quality Criteria for Water" (EPA 440/5-86-001), available at http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/upload/2009_01_13_criteria_goldbook.pdf). These records are identified as Attachment 1.

You may appeal this response to the National Freedom of Information Officer, U.S. EPA, FOIA and Privacy Branch, 1200 Pennsylvania Avenue, NW (2822T), Washington DC 20640 (US Postal Service Only), FAX: (202)566-2147, Email: hq.foia@epa.gov. Only items mailed through the United States Postal Service may be delivered to 1200 Pennsylvania Avenue, NW. If you are submitting your appeal via hand delivery, courier service, or overnight delivery, you must address your correspondence to 1301 Constitution Avenue, NW, Room 6416J, Washington, DC, 20004. Your appeal must be made in writing, and it must be submitted no later than 30 calendar days from the date of this letter. The appeal letter should include the FOI number listed above. For quickest possible handling, the appeal letter and its envelope should be marked "Freedom of Information Act Appeal".

Appendix, Item D
Public Comments and Contested Case Petition of MRVPUC
Permit No.: MN0068195

Page 1 of 8

This concludes the EPA response to the FOIA Request EPA- HQ-2014-009040.

Sincerely,

A handwritten signature in black ink, appearing to read "Elizabeth Behl". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Elizabeth Behl, Director
Health and Ecological Criteria Division

Enclosure

Attachment 1

In response to this FOIA request, EPA is providing the current, existing EPA published quality criteria guidance for states and authorized tribes to consider when developing water quality standards for dissolved oxygen. This guidance was published in the 1986 EPA document entitled, "Quality Criteria for Water" also known as "the Gold Book" (EPA 440/5-86-001), available at

http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/upload/2009_01_13_criteria_goldbook.pdf) and contains a Table 1 on page 211 the provides the following criteria guidance values for States and authorized tribes to consider when developing water quality standards for dissolved oxygen.

Table 1. Water quality criteria for ambient dissolved oxygen concentration (mg/L).

	Coldwater Criteria		Warmwater Criteria	
	Early Life Stages ^{1,2}	Other Life Stages	Early Life Stages ²	Other Life Stages
30 Day Mean	NA	6.5	NA	5.0
7 Day Mean	9.5 (6.5)	NA	6.0	NA
7 Day Mean Minimum	NA	5.0	NA	4.0
1 Day Minimum	8.0 (5.0)	4.0	5.0	3.0

In the table above, italicized values are water column values to insure (intergravel DO concentrations) for early lifestages of coldwater species. For species that have early life stages exposed directly to the water column, the figure in the parentheses apply. The guidance notes that all minima should be considered as instantaneous concentrations to be achieved at all times. The document also discussed further restrictions that apply to highly manipulatable discharges.

These dissolved oxygen criteria magnitude, frequency, and duration elements reflect the best science available at the time. In addition to the recommended values in the "Gold Book", the EPA also included information that could be used by states reflecting the state of knowledge at the time regarding dissolved oxygen dynamics and the potential for impacts on aquatic life.

The Gold Book guidance also states "A daily minimum has been included to make certain that no acute mortality of sensitive species occurs as a result of lack of oxygen. Because repeated exposure to dissolved oxygen concentrations at or near the acute lethal threshold will be stressful and because stress can indirectly produce mortality or other adverse effects (e.g., through disease), the criteria are designed to prevent significant episodes of continuous or regularly recurring exposures to dissolved oxygen concentrations at or near the lethal threshold, by the use of a 7-day averaging period for early life stages, by stipulating a 7-day mean minimum value for other life stages, and by recommending additional limits for manipulatable discharges."

EPA's 1986 Gold Book (pp. 216-217) criteria also provided information for states and authorized tribes to consider regarding monitoring of dissolved oxygen and potential

interpretation of dissolved oxygen data, which is relevant for consideration of the potential impacts of diurnal variation in DO related to this FOIA request

“The acceptable mean concentrations should be attained most of the time, but some deviation below these values would probably not cause significant harm. Deviations below the mean will probably be serially correlated and hence apt to occur on consecutive days. The significance of deviations below the mean will depend on whether they occur continuously or in daily cycles, the former being more adverse than the latter. Current knowledge regarding such deviations is limited primarily to laboratory growth experiments and by extrapolation to other activity related phenomena.”

“Under conditions where large daily cycles of dissolved oxygen occur, it is possible to meet the criteria mean values and consistently violate the mean minimum criteria. Under these conditions the mean minimum criteria will clearly be the limiting regulation unless alternatives such as nutrient control can dampen the daily cycles.” (underlining added)

“The significance of conditions which fail to meet the recommended dissolved oxygen criteria depend largely upon five factors: (1) the duration of the event; (2) the magnitude of the dissolved oxygen depression; (3) the frequency of recurrence; (4) the proportional area of the site failing to meet the criteria, and (5) the biological significance of the site where the event occurs. Evaluation of an event's significance must be largely case- and site-specific. Common sense would dictate that the magnitude of the depression would be the single most important factor in general, especially if the acute value is violated”.

“A logical extension of these considerations is that the event must be considered in the context of the level of resolution of the monitoring or modeling effort. Evaluating the extent, duration, and magnitude of an event must be a function of the spatial and temporal frequency of the data. Thus, a single deviation below the criterion takes on considerably less significance where continuous monitoring occurs than where sampling is comprised of once-a-week grab samples. This is so because based on continuous monitoring the event is provably small, but with the much less frequent sampling the event is probably not small and can be considerably worse than indicated by the sample. The frequency of recurrence is of considerable interest to those modeling dissolved oxygen concentrations because the return period, or period between recurrences, is a primary modeling consideration contingent upon probabilities of receiving water volumes, waste loads, temperatures, etc. It should be apparent that return period cannot be isolated from the other four factors discussed above. Ultimately, the question of return period may be decided on a site-specific basis taking into account the other factors (duration, magnitude, areal extent, and biological significance) mentioned above. Future studies of temporal patterns of dissolved oxygen concentrations, both within and between years, must be conducted to provide a better basis for selection of the appropriate return period.” (underlining added). The Gold Book identifies the 5 factors above as important in identifying the significance of conditions in situations where a Dissolved Oxygen criteria are not met.

HALL & ASSOCIATES

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1620 I Street, NW
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aenglish@hall-associates.com

November 6, 2014

Via FOIA Online

National Freedom of Information Officer
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (2822T)
Washington, DC 20460
Facsimile: (202) 566-2147

Re: Freedom of Information Act Request for Records Identifying Use of the Five-Day Biochemical Oxygen Demand Test as a Nutrient Response Criteria

To Whom This May Concern:

This is a request for a public records pursuant to the Freedom of Information Act ("FOIA"), 5 U.S.C. Section 552, as implemented by the Environmental Protection Agency ("EPA") at 40 C.F.R. Part 2. For purposes of this request, the definition of "records" includes, but is not limited to (1) federal guidance documents addressing the development of scientifically defensible numeric nutrient criteria under CWA Section 304(a), (2) federal register notices regarding acceptable methods for development of Section 304(a) water quality criteria, and (3) letters and memoranda regarding the approval of such numeric nutrient criteria under Section 303(c) of the Act.

Background

Recently, some state agencies which are contemplating the development of numeric nutrient criteria have indicated that the five-day biochemical oxygen demand ("BOD5") test is a valid indicator of nutrient pollution (*i.e.*, that it is an appropriate nutrient response criteria). The statements in *Standard Methods for the Examination of Water and Wastewater* – 22nd ed. regarding the use and application of the BOD5 test contains no indication that the test is intended to address the effects of nutrients on the aquatic environment. Nonetheless, some states have begun to proceed as if the BOD5 may be used as a valid response criterion for nutrient pollution, even in the absence of other indicators (*e.g.*, even when excessive plant growth is not apparent).

Appendix, Item D

**Public Comments and Contested Case Petition of MRVPUC
Permit No.: MN0068195**

Request

This request seeks all records from EPA Headquarters providing announcing to the public or providing guidance to state agencies under Section 304(a) indicating that the BOD5 test may be used as a valid response criterion when establishing numeric nutrient criteria and any correspondence approving such criteria under Section 303(c) of the Act.

Please contact the undersigned if the associated search and duplication costs are anticipated to exceed \$250.00. Please duplicate the records that are responsive to this request and send it to the undersigned at the above address. If the requested record is withheld based upon any asserted privilege, please identify the basis for the non-disclosure.

If you have any questions regarding this request, please do not hesitate to contact this office so as to ensure that only the necessary document is duplicated.

Respectfully,



Alexander J. E. English
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aenglish@hall-associates.com



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 5 2014

OFFICE OF WATER

Alexander J.E. English
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Suite 701
1620 I Street, NW
Washington DC 20006-4033

RE: Freedom of Information Act Request EPA-HQ-2015-001305

Dear Mr. English:

This letter is in response to your Freedom of Information Act (FOIA) request of November 6, 2014.

Your FOIA requests copies of the following EPA headquarters records identifying the use of the five-day biochemical oxygen demand as an appropriate nutrient response criterion:

- 1) Federal guidance documents addressing the development of scientifically defensible numeric nutrient criteria under CWA Section 304(a),
- 2) Federal register notices regarding acceptable methods for development of Section 304(a) water quality criteria, and
- 3) Letters and memoranda regarding the approval of such numeric nutrient criteria under Section 303(c) of the Act.

EPA does not have any documents responsive to your request.

You may appeal this final response to the National Freedom of Information Officer, U.S. EPA, FOIA and Privacy Branch, 1200 Pennsylvania Avenue, N.W. (2822T), Washington, DC 20460 (U.S. Postal Service Only), FAX: (202) 566-2147, E-mail: hq.foia@epa.gov. Only items mailed through the United States Postal Service may be delivered to 1200 Pennsylvania Avenue, NW. If you are submitting your appeal via hand delivery, courier service or overnight delivery, you must address your correspondence to 1301 Constitution Avenue, N.W., Room 6416J, Washington, DC 20001. Your appeal must be made in writing, and it must be submitted no later than 30 calendar days from the date of this letter. The Agency will not consider appeals received after the 30 calendar day limit. The appeal letter should include the RIN listed above. For quickest possible handling, the appeal letter and its envelope should be marked "Freedom of Information Act Appeal."

Appendix, Item D
Public Comments and Contested Case Petition of MRVPUC
Permit No.: MN0068195

Page 7 of 8

This concludes the EPA response to FOIA Request EPA-HQ-2015-001305.

Sincerely,

A handwritten signature in blue ink, appearing to read 'EBehl', is positioned above the typed name.

Elizabeth Behl, Director
Health and Ecological Criteria Division

**PETITION FOR CONTESTED CASE HEARING TO THE
MINNESOTA POLLUTION CONTROL AGENCY
Pursuant to Minnesota Rules §§ 7000.1800 and 7000.1900**

**Petitioner: Minnesota River Valley Public Utilities Commission,
NPDES Permit No.: MN0068195
P.O. Box 176
Le Sueur, Minnesota 56058-0176**

I. INTRODUCTION

Petitioner, the Minnesota River Valley Public Utilities Commission ("MRVPUC"), by and through its undersigned Counsel, hereby petitions the Minnesota Pollution Control Agency ("MPCA" or "Agency") to hold a contested case hearing to address MRVPUC's factual and legal objections to the proposed 5.4 kilograms per day (calendar month average June – September) total phosphorus water quality based effluent limit ("WQBEL") in MRVPUC's above-referenced proposed National Pollutant Discharge Elimination System ("NPDES") / State Disposal System ("SDS") permit ("proposed permit"), pursuant to Minnesota's River Eutrophication Standards, Minn. R. 7050.0150, .0220, and .0222 and Minn. R. 7053. 0205, subp. 7. C (hereinafter, "RES").

This contested case petition is based on, and hereby incorporates by reference, the preceding and simultaneously filed comment letter and appendix dated November 11, 2016 from MVPUC Chairman, Jeffery Kerkow.

**II. STATEMENT OF THE REASONS AND PROPOSED FINDINGS SUPPORTING
DECISION TO HOLD A CONTESTED CASE HEARING**

Pursuant to Minn. R. 7000.1900, Subp. 1, based on the analysis, reasoning and argument articulated in the above referenced comment letter and attachments, MRVPUC asserts the following proposed findings and reasons supporting a decision to grant a contested case hearing in this matter:

1. There are material issues of fact in dispute between the Agency and MRVPUC concerning the scientific necessity and legality of the Agency's inclusion of a 5.4 kilograms per day ("kg/day") total phosphorus WQBEL in MRVPUC's proposed permit that must be resolved in a contested case, as enumerated in Section III of the Petition (see Section III herein).
2. The MPCA's commissioner has jurisdiction over this matter and to make a determination on the disputed material issues of fact enumerated in Section III of the Petition (Section III herein) pursuant to its NPDES permitting authority under Minn. Stat. § 115.03, subd. 5 *et seq.*

3. There is a reasonable basis underlying the disputed material issues of fact enumerated in Section III of the Petition (Section III herein) such that holding a contested case would allow the introduction of information that would aid the Agency in resolving such disputed facts and making a final decision on the matter, in that the Petitioners have presented information indicating that:
 - a. Point source discharges in the Minnesota River Basin do not cause or contribute to exceedances of the RES in the Minnesota River;
 - b. MRVPUC's individual discharge to the Minnesota River does not cause or contribute to downstream exceedances of the RES;
 - c. Additional point source reductions in total phosphorus loading in the Minnesota River are not necessary to achieve attainment with the RES;
 - d. The equations used by the Agency for calculating the wasteload allocation ("WLA") and the 5.4 kg/day phosphorus WQBEL applicable to MRVPUC are unreasonable, arbitrary and capricious, exceed the Agency's statutory authority and constitute illegal rulemaking under state and federal law;
 - e. The equations used by the Agency for calculating the WLA and the 5.4kg/day phosphorus WQBEL applicable to MRVPUC fail to implement the RES' requirement to use long-term summer averaging pursuant to Minn. R. 7053. 0205, subp. 7. C., and Minn. R. 7050.0150, subp. 5;
 - f. The Agency exceeded its statutory authority by using the 80% exceeds flow condition and the 70% average wet weather design flow ("AWWDF") to calculate an overly restrictive WLA and WQBEL applicable to MRVPUC;
 - g. The Agency's use of the 80% exceeds flow condition to calculate the WLA and WQBEL applicable to MRVPUC in this case is per se arbitrary and capricious;
 - h. The Agency's use of the 70% AWWDF condition to calculate the WLA and WQBEL applicable to MRVPUC in this case is per se arbitrary and capricious;
 - i. The Agency's reliance on an internal guidance document to justify its usage of the 80% exceeds flow condition to calculate WLAs and WQBELs constitutes an illegal rulemaking under the Minnesota Administrative Procedures Act;
 - j. The Agency's reliance on an internal guidance document to justify its usage of the 70% AWWDF to calculate WLAs and WQBELs constitutes an illegal rulemaking under the Minnesota Administrative Procedures Act;

- k. The Agency failed to incorporate recent reductions in phosphorus loading from point and non-point sources in its calculation of the applicable WLA and the proposed WQBEL for MRVPUC in violation of Minn. R. 7053.0205, subp. 7. C and 40 C.F.R. § 122.44(d);
- l. That the rules enunciated by the MPCA pursuant to internal guidance documents such as the document entitled *Procedures for Implementing River Eutrophication Standards in NPDES Wastewater Permits in Minnesota* (version 1.0) November 2015, constitute unadopted and/or illegal rules under the Minnesota Administrative Procedures Act;
- m. That the RES, as applied in this case, are arbitrary and capricious because the Agency has failed to demonstrate that the conceptual framework upon which the RES relies [i.e. that decreases in phosphorus loading lead to decreases in algal growth] applies in the Minnesota River.
- n. That the RES, as applied in this case, are arbitrary and capricious because the Agency has failed to demonstrate a causal relationship between phosphorus and algal growth in the Minnesota River and the accurate degree of point source phosphorus reduction that is necessary (i.e. via the applicable WLA and WQBEL) to address excessive algal growth as required per Minn. R. 7050.0222, subps. 2b(D), 3b(D), 4b(D).

III. STATEMENT OF DISPUTED MATERIAL ISSUES OF FACT TO BE RESOLVED IN THE CONTESTED CASE HEARING

Based on the analysis, reasoning and argument articulated in the above referenced comment letter, MRVPUC asserts the following disputed material issues of fact¹ that support holding a contested case hearing:

- 1. Whether or not, based on the data presented in this case, point source discharges in the Minnesota River Basin cause or contribute to exceedances of the RES?
- 2. Whether or not, based on the data presented in this case, MRVPUC's individual discharge to the Minnesota River causes or contributes to exceedances of the RES?
- 3. Whether or not, based on the data presented in this case, additional point source reductions in total phosphorus loading in the Minnesota River are necessary to achieve attainment with the RES?

¹ MRVPUC hereby expressly reserves the right to raise additional issues and/or questions of material fact prior to, during and/or after the requested contested case hearing.

4. Whether or not the water quality data presented by the Agency for the Minnesota River is sufficient to demonstrate that a WQBEL for phosphorus of 5.4 kg/day for MRVPUC is necessary to protect downstream segments of the Minnesota River from excess algal growth?
5. Whether or not a WQBEL for phosphorus of 5.4 kg/day for MRVPUC is necessary to support downstream compliance with the RES when the applicable total phosphorus concentration, WLA and WQBEL are calculated using the long-term summer average (arithmetic mean or median) flow condition, instead of the 80% exceeds flow condition?
6. Whether or not a WQBEL for phosphorus of 5.4 kg/day for MRVPUC is necessary to support downstream compliance with the RES when the applicable total phosphorus concentration, WLA and WQBEL are calculated using the long-term summer average flow or the average dry weather flow condition for MRVPUC's wastewater treatment facility ("WWTF") instead of the 70% AWWDF?
7. Whether or not the return frequency of the 80% exceeds flow condition used by the Agency in calculating the applicable WLA and WQBEL for MRVPUC is greater than 10 years?
8. Whether or not the relationship between the wet weather flow conditions and dry weather flow conditions applicable to MRVPUC's WWTF and the Minnesota River demonstrate an alternative flow should be used to calculate the WLA and WQBEL applicable to MRVPUC?
9. Whether or not there have been additional phosphorus reductions as a result of point and/or non-point source controls in the Minnesota River Basin since 2012?
10. Whether or not the Agency performed any analysis of the impact of post 2012 NPDES permitting on phosphorus loading in the Minnesota River Basin?
11. Whether or not the Agency's calculation of the applicable WLA and WQBEL would change as a result of taking into consideration the current and future (a result of RES implementation) upstream reductions in phosphorus loading?
12. Whether or not the Agency performed any analysis of the impact of non-point source controls on the phosphorus loading in the Minnesota River between 2012 to present?
13. Whether or not, based on the data presented in this case for the Minnesota River at Jordan, the sestonic chlorophyll-a concentration is inversely related to the applicable total phosphorus concentration?

14. Whether or not, BOD data for the Minnesota River at Jordan indicate compliance with the BOD RES criterion?
15. Whether or not, based on the data presented in this case, attainment of a 150 ug/l total phosphorus concentration is required to ensure that algal criteria (Chl-a) are met in the Minnesota River, and specifically at the monitoring station at Jordon, downstream of MRVPUC's discharge?

IV. STATEMENT OF REQUESTED RELIEF

Based on the issues, reasons and arguments articulated in this petition and MRVPUC's comment letters, MRVPUC requests an order granting the following relief in this matter:

1. Enjoining the further use and application by the MPCA of all unadopted and/or illegal rules in implementing the RES;
2. Prohibiting the Agency from including the 5.4 kg/day WQBEL for phosphorus in MRVPUC's final NPDES/SDS permit;
3. Declaring the 5.4 kg/day WQBEL for phosphorus included in MRVPUC's proposed permit to be unreasonable, arbitrary and capricious, beyond the Agency's statutory authority and the result of the application of illegal rulemaking under state and federal law;
4. Requiring the Agency to re-calculate the WLA and WQBEL applicable to MRVPUC consistent with the analysis and argument presented in the attached comment letter;
5. Declaring the RES, as applied in this case, unreasonable, arbitrary and capricious and in excess of the Agency's statutory authority;
6. Granting MRVPUC such further relief as deemed just and equitable.

V. PROPOSED WITNESS LIST

MRVPUC anticipates that the contested case hearing would require 2-4 days of argument and testimony. Preliminarily, MRVPUC proposes to call the below witnesses to present evidence at the contested case hearing. However, MRVPUC reserves its right to amend its witness list in any manner contemplated by Minn. R. 7000.1800, subp. 2. C. Subject to such future amendment, MRVPUC's proposed witnesses are as follows:

1. Mr. William Hall, M.S., Environmental Engineer with Hall & Associates of Washington, D.C. Mr. Hall may present data analysis and expert testimony demonstrating the following:

- a. That a WQBEL for phosphorus of 5.4 kg/day for MRVPUC is not necessary to protect downstream segments of the Minnesota River pursuant to the RES;
 - b. That a statistically significant difference exists between the long-term summer average flows (calculated using an arithmetic mean or median) and the 80% exceeds flow condition when calculated using flow data from the same long-term summer period in the Minnesota River at Jordan;
 - c. That a statistically significant difference exists between the long-term summer average WWTF flows (calculated using an arithmetic mean or median) and the 70% AWWDF when calculated using data from the same long-term summer period from MRVPUC's WWTF;
 - d. That the return frequency of the 80% exceeds low flow condition used by the Agency in calculating the applicable WLA and WQBEL for MRVPUC is greater than 10 years;
 - e. That the relationship between the wet weather flow conditions and dry weather flow conditions applicable to MRVPUC's WWTF and the Minnesota River demonstrate an alternative flows should be used to calculate the WLA and WQBEL applicable to MRVPUC;
 - f. That point source contributions of phosphorus are not causing RES exceedances over long-term summer average flows in the Minnesota River;
 - g. That MRVPUC's phosphorus discharge is not causing RES exceedances over long-term summer average flows in the Minnesota River;
 - h. That the RES, as applied in this case, are arbitrary and capricious because the Agency has failed to demonstrate that the conceptual framework upon which the RES relies [i.e. that decreases in phosphorus loading lead to decreases in algal growth] applies in the Minnesota River;
 - i. That the RES, as applied in this case, are arbitrary and capricious because the Agency has failed to demonstrate a causal relationship between phosphorus and algal growth in the Minnesota River and the accurate degree of point source phosphorus reduction that is necessary (i.e. via the applicable WLA and WQBEL) to address excessive algal growth as required per Minn. R. 7050.0222, subps. 2b(D), 3b(D), 4b(D).
2. Mr. Dennis Wasley, MPCA Scientist, Effluent Limits Unit, Environmental Outcomes and Analysis Division. Mr. Wasley, is the author of the *Phosphorus Effluent Limit Review*:

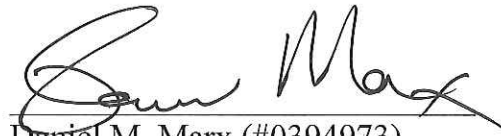
Minnesota River Basin (version 4.4), February 18, 2016, and he would testify as to the Agency's scientific and data analysis at issue in this case.

VI. CONCLUSION

Based on the foregoing, and the analysis, reasoning and argument articulated in the above referenced comment letter and appendix hereby incorporated into this petition, MRVPUC, by and through Counsel, respectfully requests the Agency hold a contested case hearing pursuant to Minn. R §§ 7000.1800 and 7000.1900.

DATED: 11-11-2016

FLAHERTY & HOOD, P.A.

A handwritten signature in black ink, appearing to read "Dan Marx", is written over a horizontal line.

Daniel M. Marx (#0394973)

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St. Paul, MN 55103

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ATTORNEY FOR PETITIONERS